HEALTH BUILDING NOTE 40

MC0148

Common Activity Spaces
VOLUME 2
Corridors

DEPARTMENT OF HEALTH AND SOCIAL SECURITY
and the WELSH OFFICE

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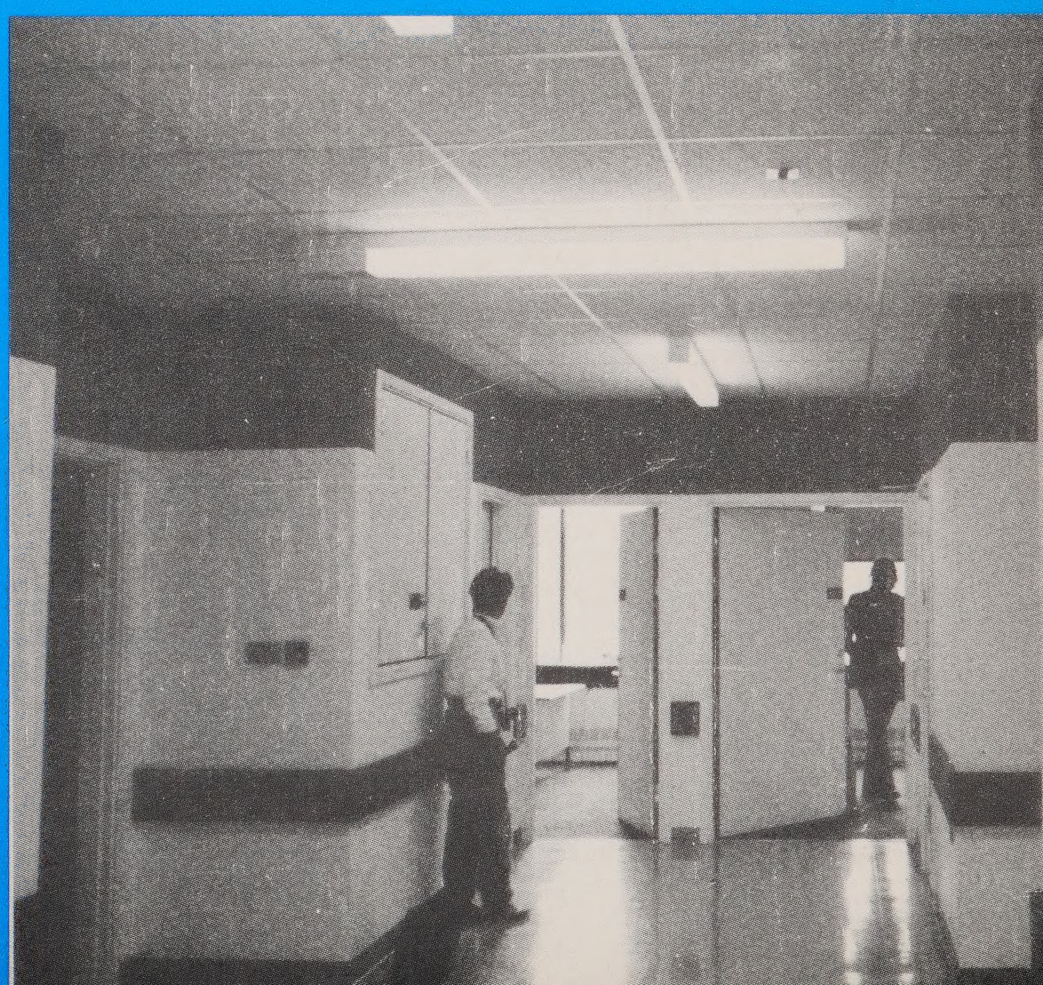

HEALTH BUILDING NOTES

Health Building Notes (HBNs) are intended to assist those involved in the briefing and design stages of schemes to provide new health buildings or to adapt or extend existing premises. The Notes contain information on relevant aspects of service objectives, functional requirements, and design. They establish standards of accommodation that are consistent with the functional requirements and form the basis for deriving Cost Allowances.

The functions, activities, equipment, environmental conditions, engineering services, and dimensions which are critical to the efficient performance of an activity, are identified and discussed but no preference for any particular configuration or plan is implied. Optional solutions with cost implications are indicated, where appropriate, leaving local planners to make their own choices.

The volumes identified by the general title "Common Activity Spaces" bring together guidance on spaces that frequently occur in common form in health buildings. Other Health Building Notes, dealing with specific departments, refer to the Common Activity Spaces building note for guidance on these commonly occuring spaces.

Reference is made in the Notes to Activity Data sheets which provide the detailed user requirements for each room or space. It is not appropriate to provide Activity Data for the spaces described in this document since the requirements vary from project to project.

The Notes are prepared in consultation with representatives of the National Health Service and appropriate professional bodies.

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Disabled People

It is essential to ensure that suitable access and facilities are provided for disabled people who have problems of mobility or orientation. This includes, besides the wheelchair bound, those who for any reason have difficulty in walking and those with a sensory handicap such as a visual or hearing impairment. Authorities are reminded of the need to comply with the provisions of the Chronically Sick and Disabled Persons Act 1970, as amended by the Chronically Sick and Disabled Persons (Amendment) Act 1976, the Disabled Persons Act 1981, and (from 11 November 1985) the Building Regulations 1985, Schedule 2. Attention is also drawn to BS 5810 : 1979 "Access for the Disabled to Buildings". One of the effects of the 1981 Act is to apply this British Standard to premises covered by the 1970 Act, which includes those open to the public. Compliance with the British Standard will also meet the "deemed to satisfy" provisions of Schedule 2 of the Building Regulations 1985 in terms of design.

This Note takes account of the requirements for elderly and disabled people, as appropriate, for the activity spaces covered. General guidance on the various aspects which need to be considered in the planning and design of a particular department is provided in the appropriate health building note. Detailed guidance concerning designing for the disabled is in preparation and will be issued in a separate volume in the near future.

I. Introduction

1. This document is the second volume of the Health Building Note, Common Activity Spaces, which provides guidance on activity spaces which frequently occur in common form in health buildings. Volume 1[1] gives detailed ergonomic data on a variety of clinical, sanitary and administrative spaces and is related to information in Activity Data sheets specifically prepared to complement that volume.

2. The second volume deals with horizontal hospital circulation and communication spaces (ie corridors and ramps) and provides guidance on the planning and design of traffic routes both within and between hospital departments with particular emphasis upon the space requirements for the movement of people, goods and equipment. A further volume, which is currently being drafted, will cover vertical movement including staircases and lifts.

3. The planning and design of circulation and communication spaces will form part of a departmental or whole-hospital project. There is therefore no direct cost allowance applicable to the spaces covered in this document. It should be used in conjunction with individual building notes; where there are requirements specific to an individual department these will be mentioned in the relevant Note. Unlike Volume I, there are no Activity Data sheets associated with this document.

4. Guidance is not provided for plant rooms or other large engineering spaces; for information about access and accommodation for engineering services reference should be made to Hospital Technical Memorandum 23 [2] which is currently under revision.

5. The information is presented in four main sections and is intended to supplement and support the detailed dimensional criteria given in Section VI — Ergonomic Data. The main types of spaces are defined and classified and the principal functional and design considerations are discussed.

General Considerations

Definitions

6. There are two main groups of spaces: those which link together individual departments (communications routes) and those which link together the various rooms within departments (circulation routes). For costing purposes Capricode [3] defines 'Communications' and 'Circulation' in the following way:

Communications

Total spaces required to provide access to, or between, the various hospital departments (eg staircases, lift wells, entrance halls, corridors, together with plant rooms and other engineering spaces such as large vertical structural shafts).

(NOTE: This document does not provide information about plant rooms or other engineering spaces)

Circulation

Total spaces required to link together the rooms of the individual departments(s) together with the space occupied by internal walls, partitions and the like.

7. Within these two definitions the following types of space can be identified:

a. *Corridor* — This is a general term applying to any linking passage-way whether within departments or between departments (eg the hospital street).

b. *Hospital Streets* — These are the primary communicating spaces for staff and patients within the hospital and interconnect the various departments.

c. *Ancillary Spaces* — These are spaces often related to communication or circulation routes and which may be required for a variety of functions eg lobbies, entrances, parking bays, to accommodate equipment etc.

d. *Lifts*, Rampways and Stairways** — For vertical communication or circulation. (* To be covered in Volume 3).

NOTE: Any of the above may be a designated fire escape route subject to fire protection procedures.

8. For the purpose of presenting the information in this document the routes have been classified as set out in Figure 1.

Economy

9. The overall hospital plan form and design should be compact so as to avoid a need for extensive communication and circulation spaces. Long routes not only add to travelling times but are tiring for patients, visitors and staff. Corridors are expensive to run and maintain and the relationship and location of departments should be such as to have these spaces at a minimum length otherwise they will add considerably to the overall running costs of a hospital. Design should be compatible with the need to provide as much natural daylight and ventilation as possible.

Communicating Routes (Between Departments)

10. The hospital street is the primary communicating route for the movement of people and goods between departments; it is the main thoroughfare which must accommodate all types of traffic and which may also serve as the main distribution network for supplies.

11. Streets generally take a linear or racetrack form and both types may also have branches. Many older hospitals have evolved over the years in a piecemeal manner into a complicated pattern. Examples of the three types are illustrated in Figure 2. Linear Streets have the advantage of allowing expansion to take place by extending the street at the ends or by adding a branch spur. The racetrack form may allow a one-way system for goods traffic to be introduced, thus avoiding congestion.

12. *Possible Critical Requirements*

a. The street has to cope with a large volume of pedestrian and wheeled traffic.

b. In a larger hospital some separation of people and goods traffic may be possible. If a trolley train system is adopted, sufficient space must be allowed for train manoeuvring, passing, parking, unloading etc. Care should be taken in ensuring that the trolley trains do not seriously interfere with other traffic. Train programming may be possible.

c. Space should be allowed for the movement of patients on beds and trolleys. Space for two beds (with attendants and attached equipment) or a tug and a bed to pass may be required. The rapid movement of a patient on a bed or trolley in an emergency situation may also have to be considered.

d. The street may also have to link vertical circulation routes such as stairs, lifts and ramps. These will normally be enclosed in lobbies for functional reasons or for fire containment. Such lobbies should be planned so that they do not impair the flow of traffic any more than is necessary. Activities such as waiting, reception, entrance lobbies, shops etc may be located in spaces adjacent to the street but they should not encroach upon the space required for the free movement of traffic.

e. Recesses will be needed to allow doors which must open outwards to do so without projecting into the corridor.(paragraph 59)

Circulating routes (within departments)

13. The departmental corridors that link together the rooms (or open plan bays) within a department can take various plan forms eg a racetrack plan form (as with some wards), a single through corridor, or a plan form dictated by the special requirements of the department (eg catering).

14. *Possible Critical Requirements*

a. The types of traffic using departmental corridors tend to be either traffic that is common to many departments (and the street) eg beds, people etc and traffic that is specific to a particular department eg patient hoist (in wards), pallet trucks (in storage areas) etc.

b. Each departmental corridor system has to cope with a range of traffic types and the rates of flow generated by the departmental plan and operational policy.

c. Particular attention should be given to space requirements for turning through openings and around bends, as

DEFINITION AND CLASSIFICATION OF ROUTES

COMMUNICATIONS SPACES	see Capricode Definition page 2	routes linking hospital departments	PRIMARY SECONDARY	
CIRCULATION SPACES	see Capricode Definition page 2	routes within a department	MAJOR MINOR	

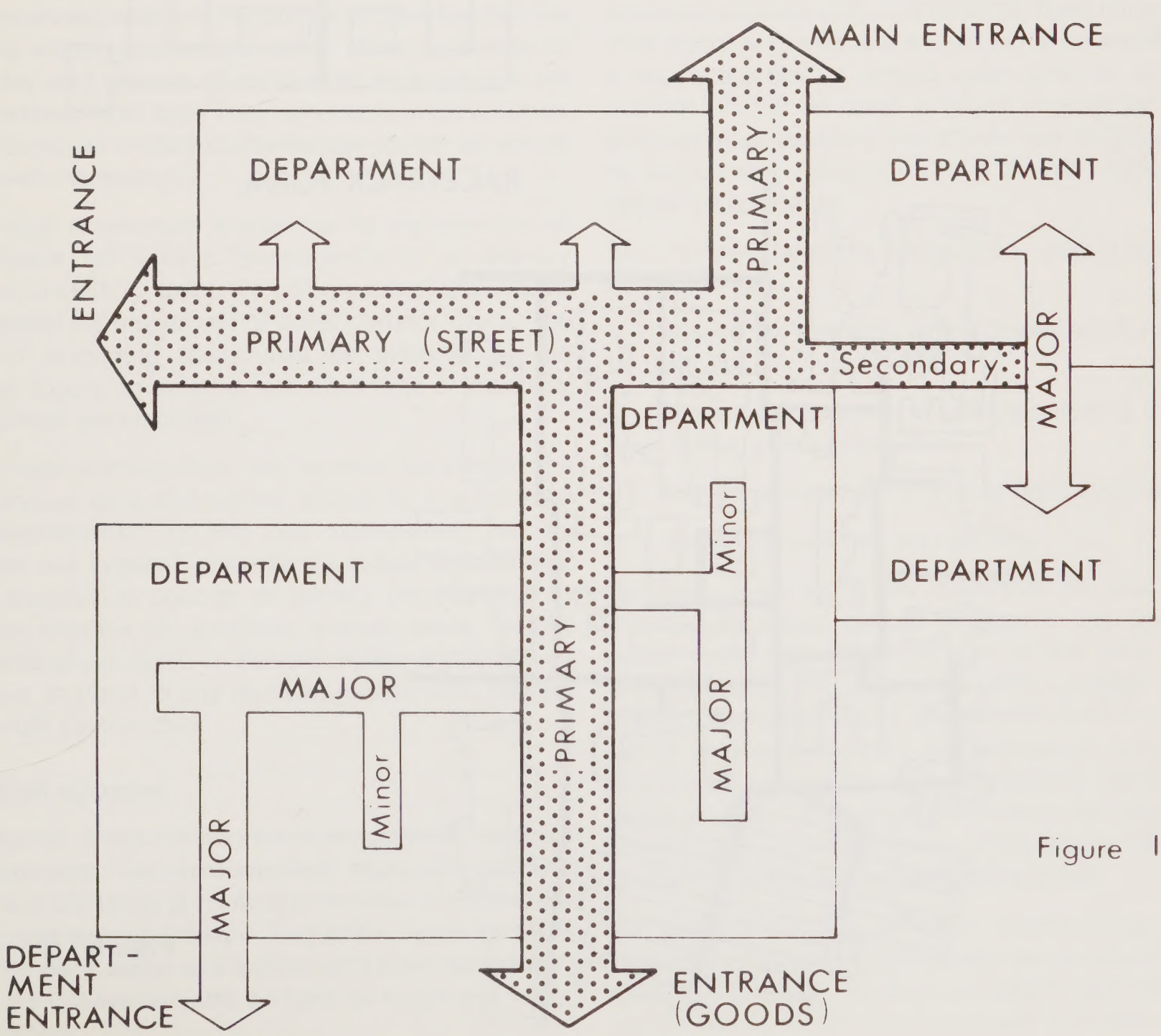
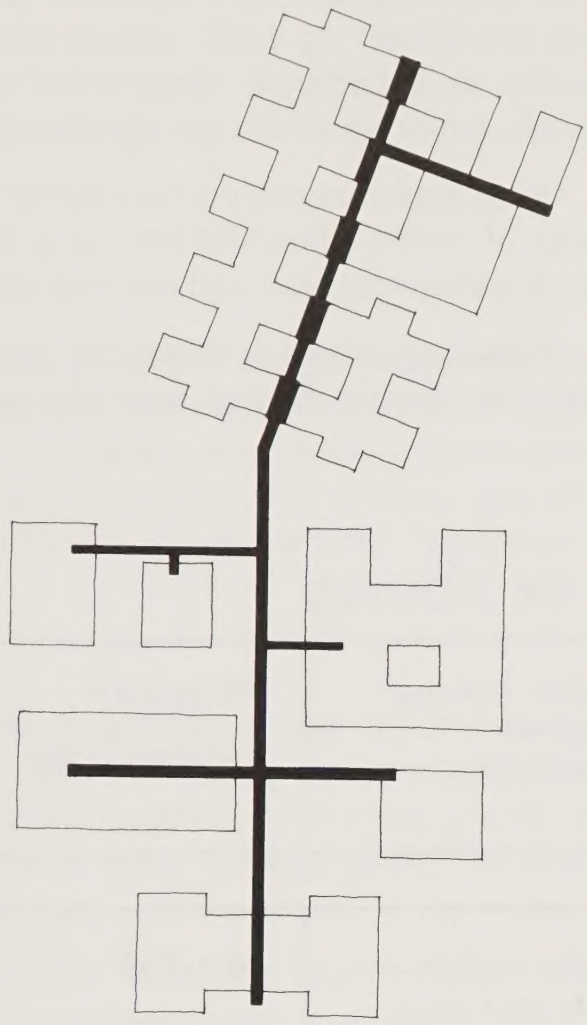
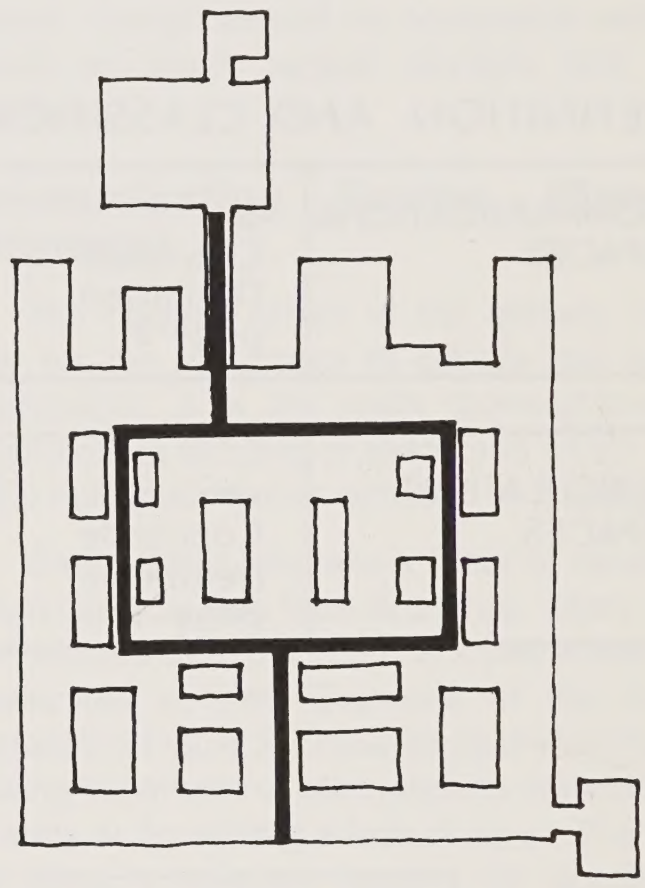


Figure 1

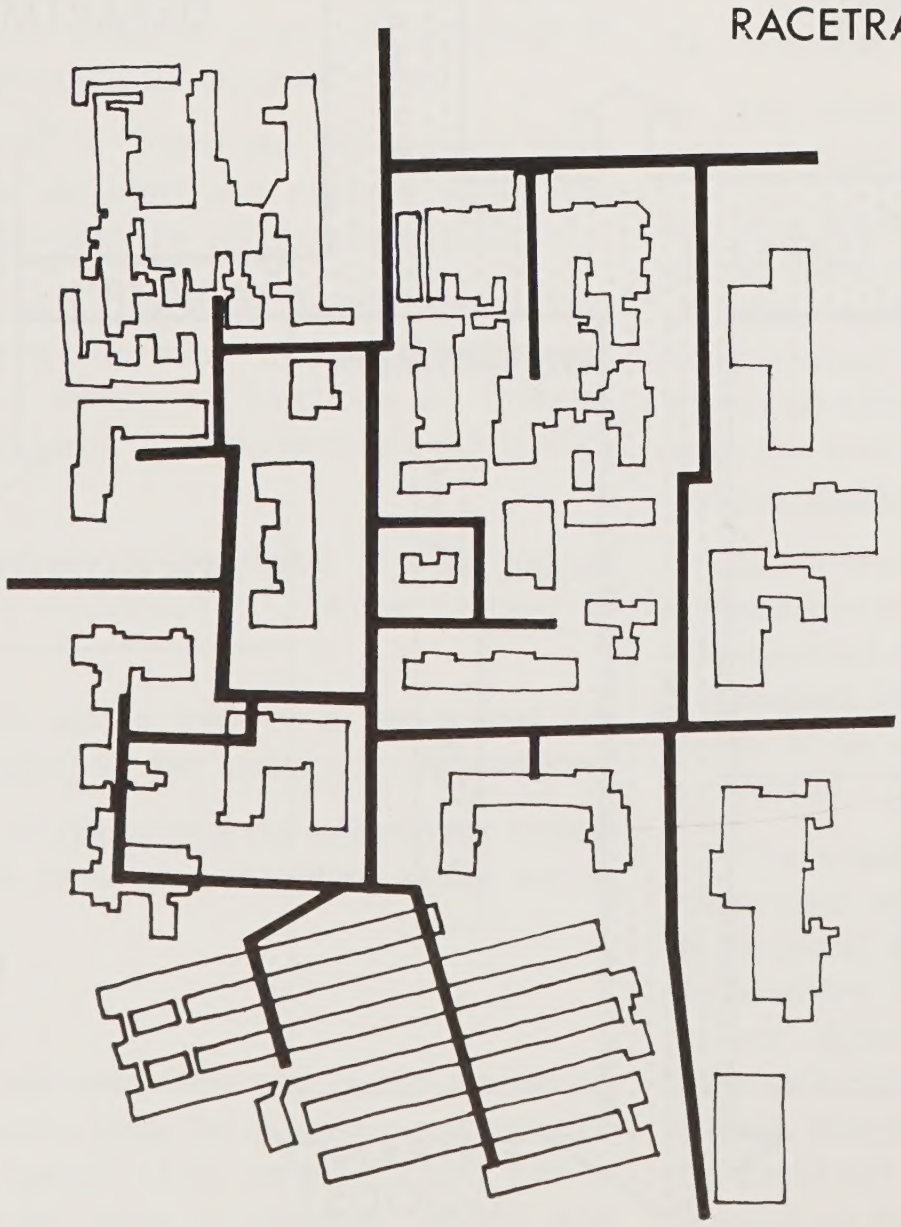
HOSPITAL PLAN FORMS



LINEAR STREET WITH BRANCHES



RACETRACK FORM



PIECE-MEAL GROWTH

Figure 2

these requirements often exceed the requirements for straight runs of corridors. Where cul-de-sac corridors occur space for turning equipment through 180° may be required.

d. Parking bays for specific items of equipment are often required to avoid obstructing the traffic flow.

e. Appropriate fire safety measures will be required and reference should be made to Health Technical Memorandum 81 [4] 'Fire safety in health care premises — Planning and design of new health buildings'. (see also paragraphs 40–42)

Movement of Goods and Supplies

15. A hospital is a major consumer of all types of goods and services, most of which have to be moved along the corridors. The design and layout of corridors and the classification of routes must therefore be based upon a thorough understanding of whole hospital policies for supply and disposal.

16. The policies for storage, laundry, catering, sterilizing, pharmacy, pathology etc will have a significant effect upon hospital communications and circulation spaces. Delivery periods (eg daily or weekly) will affect the number of journeys and therefore the amount of movement occurring in corridors at different times of a day or week. Moreover, if the effect of these policies on the space required for centralised or localised storage space is not properly assessed, space in the corridors intended for free movement will be encroached upon. (Piles of boxes on delivery day and queues of trolleys at peak periods are common examples of this. They can cause inconvenience and inefficiency and obstruct fire escape routes as well as be potentially hazardous.)

17. A proper assessment is essential for the provision of parking space for trolleys (permanently or at delivery times) and unloading space for trolleys or vehicles, so as not to impede the movement of other corridor users. The amount of unloading space may be affected by the method of supply eg whether powered tugs or manually moved trolleys are employed.

18. The main loading dock will normally be part of the central services zone and will be shared by a number of service departments. Its size and arrangement will be determined very largely by policies for supply and disposal and the operational policies of service departments. It should not become an overflow storage space for the departments adjoining it. If delivery trolley containers or pallets have to stand all day awaiting returns then parking space should be provided.

Distribution systems

19. Hospitals in this country have not generally adopted highly-automated remote-controlled materials handling systems but are tending to favour the use of electrically powered tugs towing trolleys. Tug-trolley systems make material handling easier and quicker and have the advantage that the trolleys can also be used as traditional hand-pushed trolleys.

20. Problems which can arise in the use of tug-trolley systems are damage to the building fabric and danger to pedestrians and other traffic. Good design of corridors can reduce these hazards by ensuring adequate space for movement and turning, and by providing indicators and warnings. Properly trained drivers who will exercise caution will also reduce risk of accident and damage. Tug-trolley trains should be programmed to avoid peaks in pedestrian and other traffic.

21. In some cases other types of electrically driven devices might also be applicable, for example hand-operated electric platform trucks. (see ergonomic data on TUGS and TROLLEYS.)

Ramps

22. The use of ramps to achieve vertical circulation of tugs towing trolleys may be appropriate for low-rise hospital buildings. The viability of providing a ramp depends on factors such as the number of storeys to be served and the location of main storage and distribution departments. Generally, as the number of storeys increases above three or four the ramp becomes less effective because of the distances of travel on the ramp and the slow speed of tugs pulling trolleys up the ramp. Detailed ergonomic information on ramps is provided on page 93.

23. A ramp should be used for material supply and disposal purposes only. It should not have direct access to main hospital streets, but should either be enclosed within a separate lobby or should open only on to a service corridor. It can be used in cases of emergency for the evacuation of patients, but should not be generally used by pedestrians, patients, visitors or staff, because of the danger of accidents.

24. For new hospitals the use of a ramp at the construction stage may:

a. Reduce the period in which cranes and hoists have to be used.

b. Reduce the amount of double-handling of materials used above ground floor level.

c. Reduce double-handling when equipping the building.

d. Save wear and tear on new lifts.

Provision of the ramp may mean that the total number of lifts and staircases can be reduced at the design stage, which could help offset the cost of the ramp. The main advantages of the ramp over other systems are that it makes distribution quick and flexible and it can also be useful in the evacuation of bed-bound patients in an emergency such as fire. The provision of a ramp can be a decisive factor when tugs and trolleys are used to deliver trayed meals to remote wards, when speedy distribution is necessary to achieve hot, palatable meals.

25. Ramps are only effective where a tug and trolley system of material handling can be introduced. Such a system has design implications which may affect overall capital costs, eg the need for wider corridors and doors,

provision of turning spaces and parking areas. Charging and maintenance facilities, as well as the physical area the ramp occupies, will affect the initial cost. When assessing relative costs the cost of the total system ie ramps, corridor widths, tugs, trains, staffing, maintenance etc should be compared with the total cost of alternatives eg hand- pushed trolleys, porterage, lifts, and servicing.

Secondary Functions

26. Apart from the primary function served by corridors to provide for the movement of people, goods and equipment, planners and designers should not overlook the fact that corridors often serve a number of secondary functions which can mean a gathering of people or goods at a particular point in the corridor. If these are not to interfere with the corridor's primary functions, it is essential that they should be taken into account at an early stage and adequate space provided for the facilities, location carefully considered, opening times programmed etc, so that the minimum obstruction and disruption is caused.

27. Ancillary spaces serve an important function as a place where staff, patients or visitors may arrange to meet one another. This will happen at certain locations more than others eg at the main reception or at the entrance to the staff dining room. Good planning can encourage this and other informal life of the hospital, for example by providing convenient spaces for notice boards, somewhere to sell party tickets and other similar activities.

28. Shops, banks and libraries are other amenities which depend for their success on a good relationship with the main communication routes in the hospital. The location of public snack bars and vending machines are other elements which need to be considered so that the overall pattern of movement in corridors in a hospital encourages the informal meeting of the people who use it. These functions should not be squeezed in as afterthoughts although some flexibility in the location is desirable to accommodate future changes.

Ancillary Spaces

29. The following ancillary spaces are associated with spaces required for the movement of traffic:

a. User spaces	eg Main entrance lobbies Department entrance lobbies Reception, sub-waiting, notice boards etc Staircases and lift lobbies.
b. Traffic spaces	eg Parking Department loading and/or holding Main loading dock Vehicle entrances (eg A&E)
c. Equipment spaces	eg Hose reels Switchboards Heating elements (radiators and pipe runs) Litter bins
d. Structural protrusions	eg Columns Service shafts

30. The space provision for these may be justifiably related to the communications or to departmental circulation. Each departmental building note will cover its requirements in respect of circulation eg the health building note covering the catering department will describe the need for holding of dirty trolleys within its own curtailage. In addition it will also define its use of the main loading dock in common with other service departments. If these requirements are overlooked it could result in queues of trolleys or stocks of supplies impinging upon the passage of traffic in communication spaces.

Entrance and Waiting

31. Corridors provide the passage to entry and exit points of the hospital. The main entrances should be directly related to primary communicating routes but secondary entrances may either connect to the communication system or lead directly to the circulation within a department. The number of entrances should be restricted to those that are essential, in the interests of security and economy.

32. For visitors and patients there may be waiting spaces related to main entrances eg Main waiting, Out-patients. Sub-waiting spaces should be provided in all departments. Waiting spaces should be clearly defined from the main flow of traffic and be large enough to avoid undue overspill into the communications or circulation spaces. The use of colour and/or indoor planting will be an aid to their easy identification.

Signposting

33. Visiting a hospital can be a bewildering experience and it can be all too easy for patients and visitors, particularly the elderly, to become disorientated. Staff must be able to find their way about quickly and easily and this becomes vital in situations of emergency such as fire. It is very expensive in time and money for staff to have to continuously direct people about the hospital. Clear and adequate signposting is therefore of paramount importance and reference should be made to HTM 65 Signs[5] for detailed guidance on this subject. The following are some of the main considerations which should be kept in mind.

34. The direction signs indicating the main and departmental entrances and enquiry points should be clearly visible to people arriving by public transport and from hospital roads and car parks. Access roads should lead past these entrances where patients may be off-loaded before the driver parks his car and then finds his way back to an entrance that he has already located. Outline maps of the hospital and directory boards may be placed in car parks or at enquiry points in more complex hospitals. The point of origin should be marked "You Are Here". From the enquiry points the pattern of corridors and signposting

should lead people as directly as possible to their destination without confusion.

35. At the main entrance lobby and other strategic points hospital maps with department index boards should be provided. There should be continuity of signposting along corridors from enquiry points to departments. This should be checked when a new hospital has been commissioned, when any changes are made to an existing hospital or when alterations are made to the signs. The only way to check clear signposting and continuity is for the person responsible, and someone totally unfamiliar with the hospital, to walk the various routes in the way that visitors would walk them. Signs along each route should be checked to ensure that they are clearly visible and not obscured by other objects, and that there are no gaps in continuity at any change of direction.

36. The content of signs is very important and can be most confusing to a visitor who is not familiar with technical names or abbreviations. This is not a simple problem and careful thought must be given when considering the names within a particular hospital; the Signs HTM [5] contains a preferred word list. The overriding principle is the need to ensure that the visitor or patient who is confused and perhaps intimidated by being in hospital is provided with clear and understandable signs which enable him to move around the hospital and reach his destination. It may be necessary therefore to sacrifice clinical accuracy and to err on the side of over-simplification, for example, X-Ray in place of 'Radiodiagnostic' or 'Diagnostic Imaging Department'. On the other hand it is sometimes necessary to use new terms but this need not be a problem if the signs used are very clear in their intention. Simple mistakes can be avoided by common sense and by placing oneself in the position of the visitor.

Signposting and plan form

37. At the very outset of briefing, site planning and building design, the requirement for the layout to result in simple direct routes cannot be over emphasised. It will be much easier for visitors to find their way around simple 'street' or 'racetrack' plan forms than around more complex ones. This does not mean that signposting can be neglected, but there should be need for fewer signs and it should enable a simpler method of signposting to be adopted. Plans which are easily divided into clearly identifiable blocks may be easier to understand.

Signposting and interior design of corridors

38. The use of appropriate colour and finishes as an additional signposting aid should be emphasised in the brief for the interior design of corridors. Innovation and experimentation in the use of finishes and colours on corridor walls, floors and ceilings as a means of identifying particular routes and parts of the buildings should be encouraged in selected areas when there is a means of assessing results. As yet there is no authoritative research on which advice can be based. It should be noted however that colour coding is already used to identify safety signs and such items as toilet doors in accommodation for the elderly. The use of colour needs to be such that it does not confuse or conflict with these existing uses of colour. Changes in level in a multi-storey building can be indicated by the use of large clear numerals in stair and lift lobbies and the level should be identified, but care should be taken to avoid the use of exaggerated graphics. The need to indicate changes in level is particularly important in sloping sites where ground levels can vary from one side of the building to another.

39. Although in the overall scheme these points may appear to be relatively minor and perhaps obvious, the best hospital plan and organisation can result in a great deal of time wasted by visitors and staff if sufficient attention is not given to them in the process of hospital design, commissioning and management.

Fire safety

40. At the time of writing, Departmental guidance on all aspects of fire safety is being prepared in a series of documents within the Health Technical Memoranda series commencing at No 81 (although publication may not be in strict numerical order). It is essential that project teams familiarise themselves with this guidance as it becomes available, and with the statutory regulations on the subject. In particular, the need for structural fire precautions and means of escape from the whole accommodation must be taken into account at the earliest possible planning stage. Guidance on fire safety as it applies to new health buildings and new parts of health buildings, eg extensions, is contained in HTM 81 'Fire Safety in Health Care Premises - Planning and Design of New Buildings'[4](a draft of this document has already been circulated within the NHS under the title 'Fire Safety in Health Buildings' dated September 1978).

41. Other publications in the series are: —

HTM 82 — Fire Alarm and Detection Systems (1982)[6]

HTM 83 — General Fire Precautions (1982)[7]

HTM 87 — Furniture, Furnishings, Bed Assemblies, Apparel (1983)[8]

and in preparation for publication are: —

HTM 85 — Means of escape in existing buildings[9]

HTM 86 — Safety evaluation scheme[10].

In the series 'Fire Safety in Personal Social Services Premises': —

HTM 84 — Planning and Design of New Residential Accommodation for the Elderly [11]

is in preparation.

42. It is important to establish during the design stage those aspects of fire safety strategy which affect the design, configuration and structure of a project. At appropriate stages of the design process the architect and engineer should discuss and verify their proposals with the local fire authority, and ensure that the project team and all other planning staff are fully acquainted with the *fire safety strategy* for the design in terms of operation (staff responsibilities etc), equipment provision, and buildings

and engineering layouts. Health Technical Memoranda 57, 58, 59 and 60 give detailed information on the selection of fire resisting components. The principles of fire safety apply equally to new projects and to alterations and upgrading of existing buildings. When altering or upgrading, any existing fire risks must be eliminated.

III. Environment

Environment

43. For many people the first and often lasting impressions of a hospital are determined by the environment created by the corridors, which can contribute so much towards the human face of hospitals. This can have a significant effect upon patients and staff. It is worthwhile considering therefore the factors (eg design, lighting, finishes) which contribute to the environment, although in the case of departmental corridors, these will usually reflect the environmental characteristics of the particular department.

Design

44. Design in relation to ease of finding one's way has already been considered but the corridor design can also be an important factor in determining the environment. Long uninteresting corridors are commonly criticised by staff, patients and visitors. Where possible, corridor design should incorporate measures to make corridors more interesting. These could include reducing the length, introducing changes in shape through waiting spaces and lobbies, introducing daylight and interesting outward views (possibly to landscaped courtyards) and the use of interior planting, pictures and murals etc in selected areas.

Lighting

45. The creation of a building form which permits daylight to enter corridors rather than one which embeds the corridors deep within it, is probably the most fundamental way of ensuring a more interesting environment in the corridors.

46. Artificial lighting may be used to emphasise features of shape, colour and texture. Too often, corridor lighting is monotonous; the designer should aim to produce variety as well as economy. The use of recessed ceiling fittings or indirect lighting on to interesting wall surfaces could be considered in areas such as enquiry points, and departmental entrances.

47. The decision as to the appropriate level and type of illumination will be determined by the need to ensure:-

a. safety;

b. that there is not too great a contrast with the illumination in adjacent rooms;

c. that patients in bed areas are not subjected to glare from luminaires in corridors;

d. that the medical appreciation of changes in skin colour of a patient is possible in those areas where this may be necessary;

e. that as far as is practicable, patients on beds or trolleys are not unduly disturbed by glare as they travel down corridors. The problem of glare in corridors is discussed in the CIBS Lighting Guide: hospitals and health care buildings [12], to which reference should be made; and

f. that signs are not unreadable because of glare and that light fittings are not unduly bright.

48. In areas where lamps with special colour rendering properties are installed for clinical reasons, the colours for the walls, floors, and ceilings should be carefully selected to ensure that they are compatible with the colour properties of the lamps.

Finishes

49. Project teams should collaborate with interior designers from the outset of the design stage in the selection of appropriate finishes and the overall design, and with domestic services advisers as to suitability for cleaning and maintenance.

Floors

50. The choice of floor coverings in corridors will depend upon local project options, and may be selected from a number of alternatives including PVC, linoleum or textile floor coverings. Guidance on suitable flooring is available in HTM 61 Flooring [13].

51. Textile floor coverings will generally be used at the main entrance or other waiting areas. (see the Report of the Floor Covering Study Group issued under HN (78)32 (WHN (78)92 in Wales))[14]. In corridors, particularly where hard floor finishes are selected, coved skirting should be used to form a continuous finish with the floor. The choice of finish and the design of the screed and sub floor should take account of the heavy traffic of trolleys and the occasional movement of heavy equipment along corridors.

52. Some cleaning of floors in corridors is likely to take place during the day and the design should take into account the need to 'cone off' areas being cleaned. The number of engineering access points through corridor floors should be minimal. A close liaison should exist between works and domestic services staffs. Access points for works staff to services, voids or ducts through floors, walls and ceilings should be designed and positioned to minimise soiling of panels and surrounding areas when used. Panels and fittings should be flush with the surface and not act as dirt-traps or otherwise impede normal cleaning processes.

Walls

53. Wall finishes need to be robust to withstand the wear and tear of traffic and the accidental impact of mobile equipment. They also need to be easy to keep clean and to contribute to an overall environment which is satisfactory. Textured finishes can present cleaning and maintenance problems and designers should consult with domestic services advisers in their selection. These requirements, combined with the need for economy, greatly restrict the choice of materials which may be used. Generally, walls in corridors will have a robust, washable painted finish. Places where a great deal of damage occurs may require a protective finish eg vinyl sheet (see paragraphs 69–70 on Damage). Guidance on categories of performance of finishes for walls is available in HTM 56 Partitions [15].

54. There are some places where more interesting wall finishes could be considered eg department entrances, enquiry points and the main entrance and waiting space. In such places, requiring less rigorous cleaning routines, the imaginative use of finishes can help to create a less institutional environment. Natural materials eg brick or wood or other textured finishes can be used in this way but the need for economy and practicality of maintenance and cleaning must not be overlooked. Graffiti in public places is an increasing problem; the provision of finishes which will allow its easy removal could significantly reduce costs.

Ceilings

55. Ceilings are described in HTM 60 [16].

56. The main runs of engineering services frequently follow the route of corridors and are housed in the ceiling space. Where this is the case, engineering valves and controls could well be grouped together to reduce the incidence of access points. Hatches must be provided, marked for easy location and designed and constructed so that damage to the ceiling does not occur when they are opened or closed. Ceiling tiles which are removed for access are easily damaged, specially the soft, acoustic tiles. They are rarely put back square and are generally soiled in the process. Considerable thought should be given, therefore, to the design solution of providing access. The frequency of cleaning is likely to be low in communications and circulation areas, and liaison between works and domestic services staffs is necessary to avoid unnecessary soiling to the ceiling, and injury or damage due to misplaced ladders. Double height ceilings should be avoided where possible.

57. Where services are not routed over a corridor or waiting space it may be feasible to omit a suspended ceiling and expose the soffit of the structure. This can have an advantage of providing extra ceiling height over large areas such as main waiting provided that the finish can be made attractive and does not present major cleaning problems (such as the need for platforms).

58. Waiting spaces and corridors can be noisy and a sound attenuating ceiling, together with the use of soft floor coverings where appropriate, can help to reduce the noise levels. In spaces which do not require a high degree of cleanliness for clinical reasons the use of textured acoustic tiles or applied finish may be appropriate.

Doorsets

59. Doorsets are described in HTM 58 Internal doorsets[17]. Door leaves in corridors may be painted or faced in hardwood veneer or plastic sheet. Door edges and faces should be protected against damage, particularly if wood finishes are specified (see HTM 59 Ironmongery [18]). Doors which open into corridors should be set into recesses so that the open leaves do not obstruct the corridor.

Cleaning and Maintenance

60. Domestic services staff responsible for cleaning in communications areas will normally operate from a team cleaners or heavy duty cleaning room. These rooms are recommended at the rate of at least one per floor and should contain all the equipment and materials for their area of responsibility (for further information refer to Volume I of Common Activity Spaces)[1]. Some cleaning activities will inevitably necessitate access being temporarily restricted. Cleaning machines will require access to electrical socket outlets at regular intervals and on both sides of long corridors to avoid the use of unneccessarily long extension leads which can prove extremely hazardous.

61. The need for the cleaning and maintenance aspects to be taken into account in the selection of floor, wall and ceiling finishes has already been emphasised, (paragraphs 49–58). Other factors which should be noted are:-

a. Windows should be accessible to cleaners. Special consideration should be given to windows above ornamental ponds, pools and cultivated areas. Windows of the louvre type are costly to maintain. Clerestorey windows should not be used in situations where they will be inaccessible for cleaning.

b. Drink vending machines should not cause obstruction; easily cleanable spillage protection should be provided to cover the immediately surounding floor area.

c. Areas in which smoking takes place should be well ventilated and provided with ample and prominent "fire safe" receptacles, which cannot easily be removed.

d. Spillages, whether they be water, food, oil or any other substance, must be dealt with as quickly as possible to avoid injury to people, damage to building fabric and increased costs.

e. Graffiti should be dealt with without delay, as it has been found that to ignore it encourages further incidence. This is particularly so in the areas around public telephone boxes and in sanitary areas, particularly WCs.

f. Design/landscaping of interior courtyards should take account of equipment needed for their maintenance. Solutions requiring, for example, gang-mowers to be moved along hospital corridors, or across carpeted areas should be avoided.

g. Multi-fin radiators are very costly to clean and alternative types should be considered if engineering requirements allow.

Barrier zones

62. Every attempt should be made to reduce the amount of dirt which enters into health buildings, whether on footwear, wheels of trolleys and chairs, walking aids or in the atmosphere. The provision of an effective barrier zone at main entrances will not only assist in achieving this but may also have a significant effect upon cleaning costs throughout the building. A plan of a typical barrier zone is shown at Appendix 2 of the Report of the Floor Covering Study Group issued to Health Authorities under HN(78)32 (WHN(78)92 in Wales) [14].

63. The exterior should be protected by a canopy of a suitable size to allow an area of ground to be dry even in the worst weather. The ground beneath the canopy should ideally be slightly roughened as this will cause people to involuntarily start scraping their feet before arrival at the entrance.

64. The size and shape of the entrance will determine the best form of dirt removal zone. Preferably there should be two sets of double doors with a space between which will permit several steps to be taken or at least two circumferences of wheels of chairs. This area should be capable of removing the majority of dirt and moisture by provision of one or more surfaces which have scraping and moisture absorption characteristics. Dust control matting in tile form is well suited to this area. It is important that:-

a. the area should be large enough to remove the majority of dirt and moisture before the interior is gained, and,

b. the domestic services effort at this point is increased to prevent dirt accumulating and being transmitted from this zone.

65. If however the double door solution is not practicable it may be advisable to use other material and create an additional zone as shown in HN(78)32 (WHN(78)92 in Wales)[14]; solutions should be discussed with domestic services advisers at the planning stage.

66. The provision of mat wells of any form is expensive, ineffective and not recommended. Coir mats rapidly become dirt transmitters and are almost impossible to clean.

67. Barrier zones are required not only at main entrances. Protection should also be afforded at other peripheral points of access; the most appropriate solution will depend upon the frequency and nature of use and should be selected in consultation with domestic services advisers.

Control of waste

68. The floor of entrance/exit lobbies, corridors and waiting spaces will inevitably be used as a convenient dumping ground for all types of litter if suitable receptacles are not provided at convenient intervals in prominent positions and distinctively marked. The best types of receptacles are those not easily removed, non-combustible and easily emptied and cleaned. Obvious places include lift and stair lobbies, near any vending machines, snack bars, shops or other gathering points and at entrances to no-smoking areas.

Damage in Corridors

69. The causes of damage in hospitals have been the subject of numerous investigations in recent years. Two of the major factors which have been identified are the poor design of corridors and the equipment passing through them. In addition the building fabric may be more prone to damage as a result of the use of construction materials which lack robustness. Long travel distances, tortuous circulation routes, unnecessary walls, doors and door closers, inadequate widths, excessive projections from the wall face on circulation routes, and general lack of attention to design details are the building design features which lead to damage in corridors. Added to this is the need to comply with statutory regulations relating to fire safety necessitating the provision of additional doors on circulation routes which may impede traffic movement. The damage due to such defects in the design of buildings is further compounded by staff mis-use and by the use in recent years of heavier mechanical equipment for the movement of patients and supplies. Arising from investigations the following points have been identified, which if observed, would significantly reduce the level of damage:-

a. It is virtually impossible to protect buildings so that they will never be damaged by hospital equipment at present in general use. All existing equipment should be examined with a view to preventing further damage. If revolving buffers were fitted to all salient angles and above castors of mobile equipment, a considerable improvement would be effected. Reference should be made to the relevant British Standards and to the advice given in the Department's DS (Supply) letter 42/75 [19]dated 5 August 1975 about buffering of movable equipment.

b. Damage will be less where corridors are adequate in width (see Ergonomic Data) and door openings are in accordance with HTM 58 Internal doorsets[17]. Narrow spur corridors and corridors with abrupt changes of direction should be avoided.

c. The most common areas where damage occurs is on the external corners of walls on corridors. Where changes of direction occur some protection of external arrises is necessary, however well equipment may be protected. Advice on corner protection is given in HTM 59 Ironmongery [18]. Damage to corners occurs at many different levels, but mainly between 100 mm and 1,000 mm height and may be found whether or not equipment is protected; this is due to the heavy nature of many pieces of equipment. Corner buffers must be securely fixed to walls, be of a material which is not easily gouged or splintered, and be energy absorbing to lessen shock to patients and transferance of impact to the building fabric. They should cover the whole area likely to be subject to damage.

d. In areas where trolleys or heavy mobile equipment are stored or parked, continuous wall finishes of plastics or similar finishes should be considered in preference to trolley guards of limited height.

e. All door edges should be protected. These are the most vulnerable parts of the door. Door closers should not be used unless absolutely necessary. Closers should retain

at 90°, except on fire resisting doors where fire door holders should be fitted to permit free passage of people and mobile equipment without damage.

f. Corridor floors have to carry a great deal of heavy traffic and are therefore vulnerable to damage unless the sub-floor and screed are correctly designed and specified and the appropriate floor finish is selected, with special attention being paid to the joints between tiles or sheets and covings.

g. Protection is of no use unless it is applied where the damage occurs. Most of this is predictable but it is suggested that, other than the most obvious locations, protection should be applied after the building has been in use for a period, during which time the most vulnerable areas will become apparent.

70. The cost implications of construction, finish and protection together with consequent savings in maintenance and cleaning must be fully considered to achieve the most economic balance between capital and running costs. (See also paragraphs 106–110.)

IV. Engineering

Engineering

71. Building design involves the reconciliation of many different and conflicting requirements and hospital design is probably the most exacting of all. The engineering services for a modern health care building are complex and must continuously satisfy a multiplicity of needs including heating, cooling, ventilation, power and lighting, communications and alarms, medical gases, fuel gas, hot and cold water and drainage. The unsuccessful integration of these services within the building fabric will seldom be more apparent than if the cold functionalism of pipework and cables installed in patient circulation spaces is left unconcealed.

72. Invariably the horizontal distribution of services will follow circulation routes and in patient areas they should be installed in the void above suspended ceilings with sufficient clear space to accommodate drainage gradients and to allow the necessary safety clearances between adjacent services recommended in BSCP 413[20]. Adequate means of access and space for maintenance and the periodic replacement of services will be required. (Paragraph 56)

73. Below the ceiling the environmental conditions within the corridor or circulation space should complement those of the adjacent areas served. Thus the location and the need to ensure that traffic can circulate safely will be the major factors that will determine the engineering design.

Safety

74. Section 6 of the Health and Safety at Work etc Act 1974[21] imposes statutory duties on all persons who design, manufacture, supply, install or erect "articles" for use at work, to ensure, as far as is reasonably practicable, that such articles are safe and without risk to health when properly used. Engineering systems eg pipework, terminals etc are covered by the term "articles" and thus these duties apply to the designers of engineering services for non-domestic buildings.

75. Design guidance relative to the fire safety requirements in new health buildings, including specific references to escape routes, is given in HTM 81[4]. Technical information concerning the design and specification of fire detection and alarm systems is detailed in HTM 82 [6]which also replaces or modifies certain clauses of BS 5839 Part 1[22] to meet the needs of health care premises. More general advice on fire protection and training requirements is given in HTM 83[7].

76. The design of the engineering services should accord with the recommendations in the above series of HTMs and the engineer should verify his proposals in accordance with the procedure described in paragraph 41.

77. To minimise inconvenience to patients and staff when maintenance procedures are being undertaken, the engineering sub-distribution and control centres eg electrical distribution, medical gas isolation etc, will generally be located off corridors and circulation spaces. Adequate safeguards to prevent unauthorised access to the equipment within these centres will be required.

Noise

78. Excessive noise in communication and circulation spaces, whether internally or externally generated and transmitted, is disturbing and can adversely affect the operational efficiency of hospital departments. The means of control advocated in Hospital Design Note 4[23], including its revisions[23]and Engineering Data Sheet DH 1.2[24] should provide an acceptable acoustic environment. The engineering services should be designed to achieve noise levels below 70 dB(A) in spaces used mainly by goods traffic and below 55 dB(A) elsewhere.

Mechanical Services

Heating

79. The environmental temperatures to be maintained by the heating systems should not fall below the following levels:

Communicating routes (Hospital street)	18°C
Departmental circulating spaces	As for associated departments

Othe areas will depend on main user as follows:

Spaces used by patients	18°C
Spaces used by staff	16°C
Spaces used for goods delivery	10°C

80. When determining heat loss the infiltration of air should be taken as 1½ air changes per hour for any circulation spaces on or connected to the perimeter of the building. Depending upon their relative volumes, a higher rate of infiltration may be necessary in perimeter corridors serving intensively used deep-planned areas where mechanical extract systems induce air movement for ventilation and odour control.

81. The installation of heat emitters and associated pipework should not cause any impediment to passing traffic and neither should they reduce the minimum clear

width of corridors as exemplified in Section VI of this Note. Guidance regarding the selection and use of heat emitters including installation and maintenance is given in Engineering Data Sheet DN4[25].

82. Intensively used entrances and exits (particularly the main entrance) will require some form of protection which will reduce the ingress of cold air without hindering the passage of wheelchairs or stretchers. It is advisable to provide some form of heating in the vestibule to temper the incoming air.

Ventilation

83. The fenestration of perimeter corridors provides an important contribution to the natural lighting and ventilation of health care premises. Seasonal control of infiltration requires opening lights that are fully adjustable between maximum and minimum to provide optimum air movement without prejudicing safety, security or comfort, and which are draught-free when closed.

84. Where totally-enclosed corridors serve deep-planned, mechanically ventilated accommodation, eg sanitary facilities, then a supply air system will be required with sufficient volume to ensure that the corridor is maintained at a positive pressure. In departments open only during the daytime (ie "9 to 5 departments"), consideration should be given to the extended running of 'dirty' extract systems under time-switch control to ensure adequate purging.

85. When control of excessive odours using mechanical extract is required, a tempered make-up air supply from a corridor to effect a minimum of six air changes per hour in adjacent accommodation may be necessary.

Electrical Services

86. The electrical installation will comprise switchgear, wiring and equipment for lighting and power and may include power supplies for environmental plant and controls eg smoke extract at lift entrances. Extensions from the hospital central system for telephones, fire alarms and communications systems will also be required. These installations should comply in all respects with current Regulations for Electrical Installations[26] and conform to the advice given in HTM 7 Electrical services: Supply and distribution[27].

87. Normal and emergency power supplies should be available from the one or more switchrooms associated with the department(s) that the corridor or circulation space serves. These local distribution centres will also house power supplies and controls for communication and alarm systems and adequate space will be required for access and maintenance.

88. Precautions are required to ensure that electrical installations and installed equipment, eg luminaires and lift motors, are not a source of radio-frequency radiation or transients which could adversely affect electro-medical equipment in adjacent departments. Guidance concerning the avoidance and abatement of electrical interference is given in HTM 14 Abatement of electrical interference[28], and switch-start fluorescent luminaires should comply with BS 5394[29].

Electrical installation

89. The electrical installation in occupied areas should be concealed using PVC insulated cable in screwed steel conduit, or trunking. External installations, or any part within the building subject to external conditions eg covered walkways, should comprise PVC insulated cables in galvanised screwed steel conduit with fittings of weatherproof pattern. Steel conduit and trunking for communications systems should also be concealed whenever possible.

90. The selection and location of luminaires can make a major contribution to the creation of a non-institutional environment in corridors and circulation spaces. The use of colour finishes, graphics and lighting should be co-ordinated to establish a calm and welcoming atmosphere whilst contributing to the safe movement of traffic. Practical methods of lighting these areas are contained in the CIBS Lighting Guide [12] and information concerning standard reference luminaires is given in Engineering Data Sheet DE 1[30].

91. To obtain the recommended illuminance in corridors the design calculation should take account of the proposed luminaire's photometric data related to its mounting height (above the floor) and the corridor's surface reflectancies. As a guide, typical space to mounting height ratios for various corridor widths are indicated in Figure 3. This data was derived from photometric curves of typical Type A luminaires installed 2.7-3.0m above floor level and assumes surface reflectancies of 50% for ceilings and 30% for walls. Where corridors are between 4.0m and 6.0m wide, two rows (lines) of luminaires will usually be required and the space/height ratio indicated is for each row.

92. In circulation areas where medical appreciation of changes in a patient's skin colour is important, light sources should have suitable colour rendering characteristics[31]. Architects and engineers should collaborate to ensure that surface decorative finishes are compatible with the colour rendering properties of the light source and that spectral distribution of the resulting luminous flux is not adversely affected. Limitation of glare is also important, eg luminaires installed adjacent to bed areas should have their light source screened from the direct vision of a patient in bed.

93. Direction signs should be illuminated by the general lighting so that they are clearly legible without being masked by reflections or glare from nearby luminaires or windows. Internal lighting of direction and location signs is usually reserved for signs of major importance which need to have a visual impact eg Exit signs.

94. Control of lighting is normally by local switches and these should be provided in sufficient numbers to allow variation in lighting intensity eg reduced levels of illumination at night when security permits, and to encourage energy conservation. This is particularly relevant where sections of a corridor may have natural light eg from courtyards, whilst the remainder is deep-planned.

Although higher standards of illuminance are recommended for spaces that are deep-planned, excessive contrast with adjacent areas at night should be avoided.

Equipment

95. Domestic cleaning appliances having flexible leads nine metres long should be assumed and 13 amp switched shuttered socket outlets should be provided to enable such machines to operate over the whole range of the space concerned. In corridors over 3m wide cleaning appliance leads should not trail across the thoroughfare to obtain a power supply.

96. Battery charging of electrically-propelled vehicles, eg tugs, should be undertaken in purpose-designed locations remote from areas to which patients and the public have access. Parking and charging bays for manually-propelled mobile X-ray machines should be located where oversight by staff can deter unauthorised operation of exposure controls. Although only minute quantities of acid or alkaline gas are evolved from the modern 'closed' batteries used for charging the X-ray tube, adequate natural ventilation will be required.

Emergency electricity supplies and lighting

97. Guidance on provision of emergency electricity supplies is given in HTM 11[32]. Emergency lighting should be provided to enable safe egress from the building and should comply with British Standards Code of Practice BS 5266 Part 1[33] and be an integral part of the hospital system and in accordance with the whole hospital policy.

Staff location

98. Where the accommodation is associated with other hospital departments having a staff location system, extensions will be required. Guidance on staff location systems is given in HTM 20[34].

Telephones

99. Telephone facilities for internal and external calls in either separate or combined form will be available centrally and extensions to serve some circulation spaces will be required. Public coin-operated telephones will be required for use by patients, visitors and staff and will normally be installed in circulation areas adjacent to patient waiting spaces, main entrance, staff dining room etc, due regard being given to the needs of the disabled. Their location should allow reasonable auditory privacy without the necessity to provide acoustic hoods. A telephone jack outlet should be provided in the space allocated for parking the coin-operated telephone trolley used in wards. All coin-operated telephones will be connected direct to the public exchange and a number of jack outlets can be common to one exchange line. To minimise expenditure, a balance will need to be maintained between capital or rental costs and service to patients and staff.

Clocks

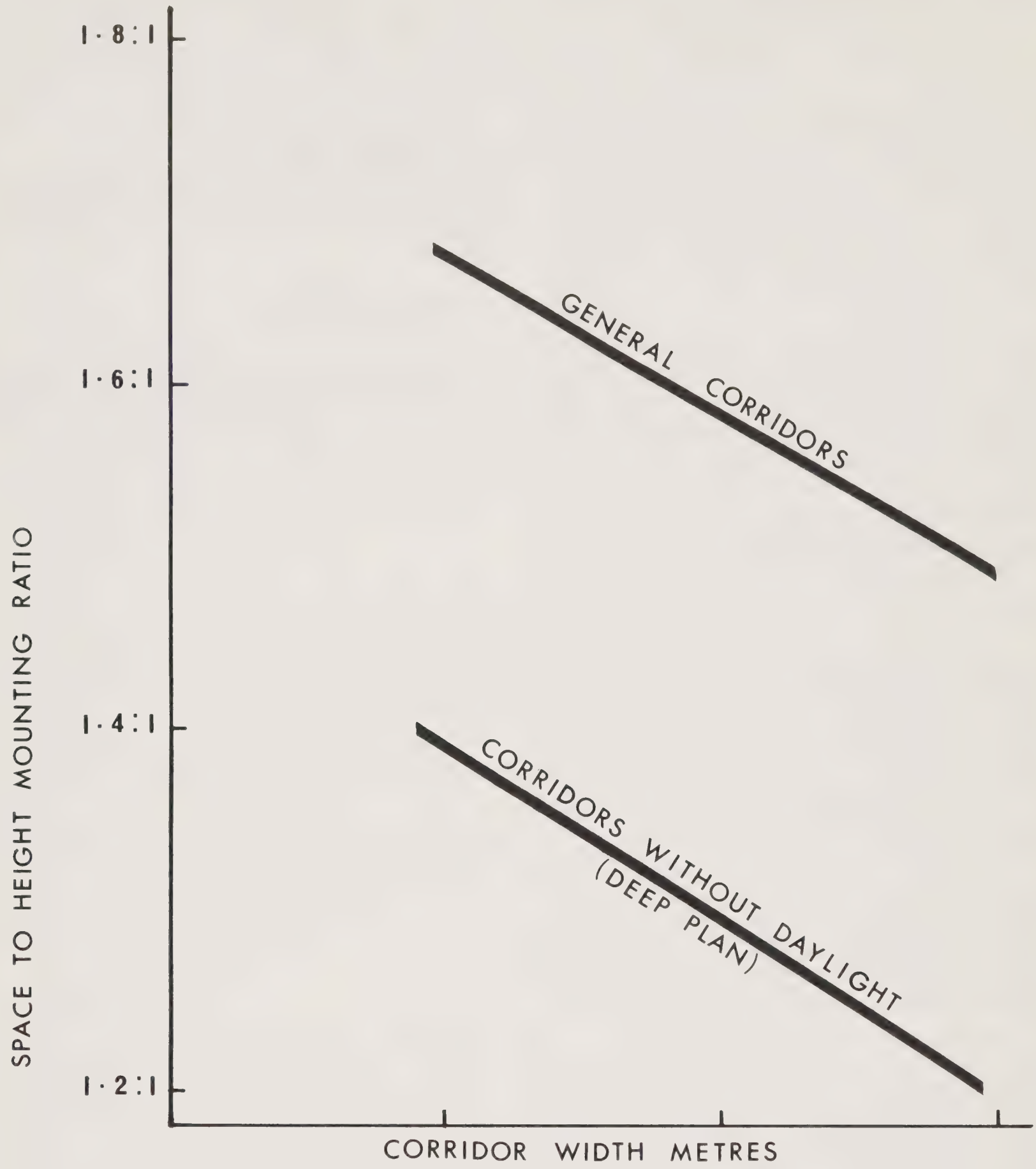
100. Clocks should be consistent with those used in the remainder of the hospital and have legible upright Arabic numbers. Clocks should operate in conjunction with a master clock system. If such a system is not available, synchronous clocks should be installed using a common clock circuit suitable for future connection to a master system. The number of clocks provided should be kept to a minimum and they should be installed only where they can be viewed by numbers of staff/patients/visitors.

Cardiac arrest alarm

101. Where the remainder of the hospital has this facility it should be extended to cover the relevant circulation areas.

Lightning protection

102. Protection against lightning for the rest of the building provided in accordance with BS Code of Practice No 326[35] should be extended if corridors are outside the protected zone. Guidance is also given in HTM 7 [27] and HSE Data Sheet DB 2[36].



SINGLE ROW :	1·0	2·0	3·0
TWO ROWS :	4·0	5·0	6·0

Figure 3 : TYPICAL SPACE TO HEIGHT MOUNTING RATIOS FOR TYPE 'A' LUMINAIRES MOUNTED 2·7m TO 3·0m ABOVE FLOOR LEVEL.

Cost Considerations

Cost Allowances

103. As this document gives guidance on activity spaces that occur throughout health buildings it does not attract a separate cost allowance. (paragraph 3)

Circulation

104. The cost of circulation forms part of the departmental cost allowance; the amount allowed for in each allowance is shown as a percentage in the relevant Health Notice. The circulation spaces covered by the departmental cost allowance will include:

a. Corridors and any other areas required for movement between or through the activity spaces.

b. The area taken up by internal walls and partitions.

c. An engineering zone adjacent to the external walls.

d. Minor vertical ducts.

Communication

105. The cost of communications forms part of the on-costs, and are allowed as a percentage addition to the departmental cost of the scheme. The space for communications will include:

a. Staircases, lift wells, main waiting and entrance halls, corridors, and any other areas which provide access to, or between, the various departments of the hospital.

b. Plant rooms and other engineering spaces, such as large vertical structural shafts for the use of engineering services between departments.

Economy

106. Spaces for circulation and communication are a functional necessity. They should be provided as economically as is practicable, while ensuring that their functional requirements are met. It should be remembered that excessive provision can have an adverse effect on other and often more important parts of the scheme.

Maintenance, Cleaning and Damage

107. Corridors are intensively used spaces and the need to consider the running cost implications of design and particularly of maintenance, cleaning and protection tions of design and particularly of maintenance, cleaning and protection is of great importance. Corridors are specially vulnerable to damage by tugs, trolleys and beds and it may be necessary to commit capital to give protection against mechanical damage. The use of quantitive appraisal techniques, such as "equivalent annual charge" and "present worth", should form part of the decision-making process to ensure an economic balance between capital and running costs.

108. Areas where there will be movement of beds, tugs and trolleys will require robust and durable construction and finishes. The selection of finishes must take into account the work of domestic services; cleaning is likely to be carried out by mechanical means and finishes must be suitable for this to be done. Recesses and projections should be avoided, but where this is not possible, they should be designed to allow for mechanical cleaning.

109. The problem of damage has been mentioned in detail elsewhere in this Note (paragraphs 69-70). Damage to walls is likely to be of particular concern. Plasterboard partitions in accordance with HTM 56 Partitions [6] and the like are liable to be damaged by excessive hard body impact and particularly by the lack of or inadequate buffering of mobile equipment. These partitions will have therefore a greater need than those of masonry construction for buffer rails or protective wall coverings.

110. The use of effective energy absorbing buffering can reduce trauma to patients and result in lower maintenance costs both for repair of equipment and the building fabric. The use of unsuitable materials such as hardwood, soft aluminium or brittle non-resilient plastic should be avoided as they are easily damaged and the subsequent maintenance and cleaning cost is wasteful of revenue resources.

Energy

111. Heating and lighting are major running costs and the provision of circulation and communication spaces should be as economical as is practicable to minimise energy expenditure.

VI. Ergonomic Data

Introduction

112. The overall dimensions of a particular circulation space are dependent on the type and the rate of flow of traffic that has to be accommodated. These factors are influenced by hospital size, department sizes and types, overall plan form and various policy options. Therefore it is not possible to make specific recommendations on the corridor widths.

113. However, the ergonomic data gives the space requirements for the circulation of people and individual items of equipment. The application of these dimensions should allow each part of a circulation space to be planned to cope with its critical requirements for traffic flow, passing conditions, turning space, parking etc. It is important that these factors should be carefully assessed so that a corridor width is selected using the procedures set out on pages 41 and 42, which is appropriate for the anticipated requirements but which is not extravagant in the use of space.

115. The data sheets dealing with each of these components are arranged in the following sequence:-

- straight movement
- turning around a 90° bend
- turning into and out of doors
- turning through 90° and 180°
- parking

116. The drawings are prefaced with a set of explanatory notes and worked examples, and each group of drawings has its own introduction.

Contents

114. The data is arranged as follows:-

Movement of people -including space requirements for people walking or being transported on wheeled equipment

	Page
Bed (King's Fund)	26
Patient Trolley	36
Patient Hoist	40
Person (walking, walking with aids)	43
Wheelchairs (independent and assisted use)	51

Movement of goods and equipment

	Page
Trolley/Mobile Equipment (typical examples and related trolley/equipment sizes)	65
Platform Truck	75
Pallet Truck	78
Sack Truck	82
Tugs and Trains	87

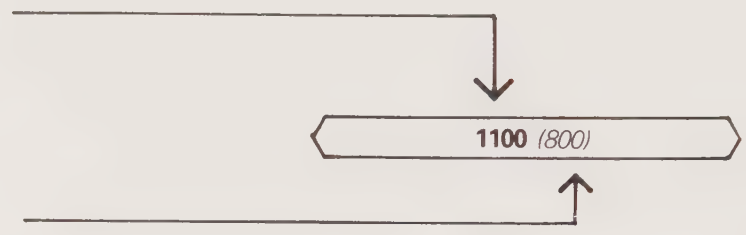
Explanatory Notes and Worked Examples

Dimensions

Two types of dimension are used to define the space required to move components — ie preferred dimensions (shown in bold type) and restricted dimensions (bracketed and shown in italics).

Preferred dimensions are appropriate where a movement is frequent and/or important.

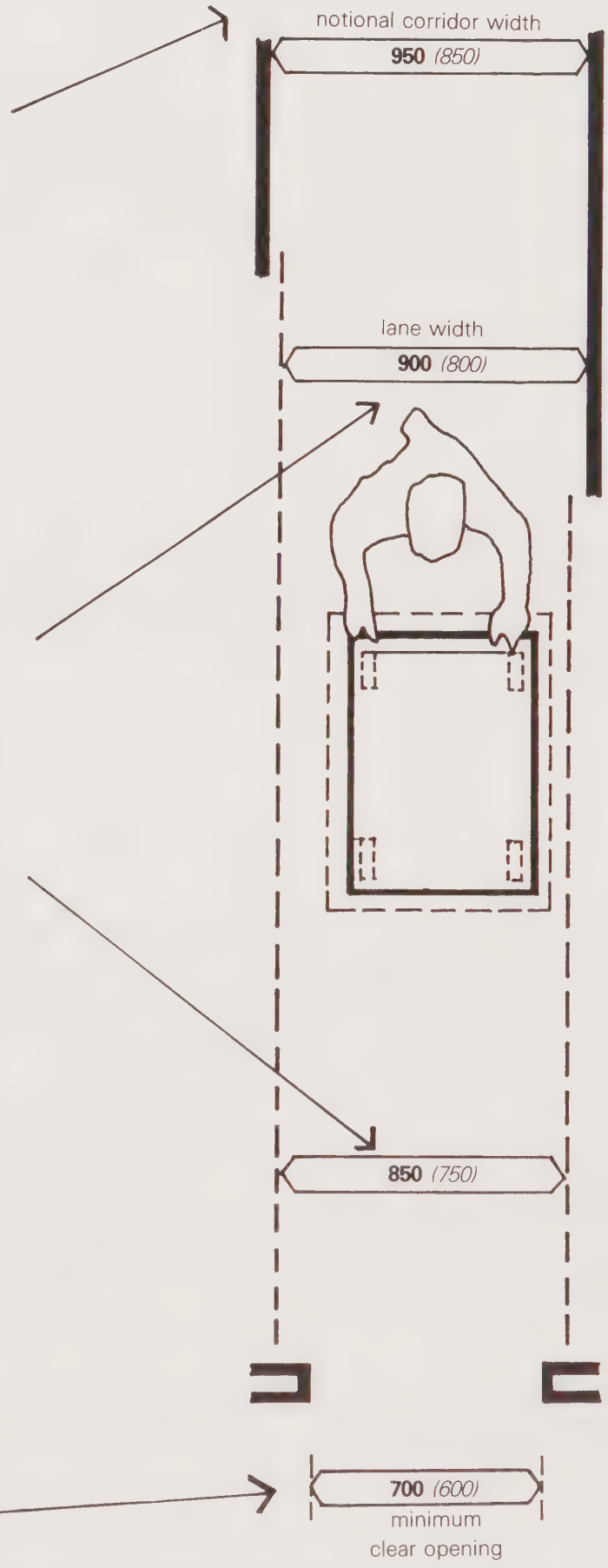
Restricted dimensions may be acceptable where the movement is infrequent, but will impose the need to exercise 'considerable care to avoid damage to building fabric' and/or component during movement.



Straight movement

NOTIONAL CORRIDOR WIDTHS

The dimensions shown between unbroken lines are the widths of corridor required to move (ie push, pull) the particular component in a straight line. Preferred dimensions are appropriate for corridors over 10m in length where movement is frequent and/or important.



Lane widths

Lane widths are used to calculate the overall space required when two or more components pass. Two types of lane width dimensions are used:

a. Dimensions shown between one dotted and one unbroken line refer to a lane width requirement adjacent to a wall.

b. Dimensions shown between two dotted lines refer to movement bounded on both sides by other activities.

Lane widths are less than the equivalent corridor widths as they compensate for the overlapping of clearances that can occur between two passing components. Where restricted dimensions are given they refer to one component/person temporarily stopping to allow passing to occur. Therefore they are only applicable where the movement is infrequent and non-urgent.

OPENING WIDTHS

Passing through openings involves a shorter travel distance (1-2m) and the dimensions given assume a reduction in speed and that greater care will be exercised.

The restricted (bracketed) widths will just allow passage through the opening to occur, but damage to building fabric and components is likely unless care is exercised.

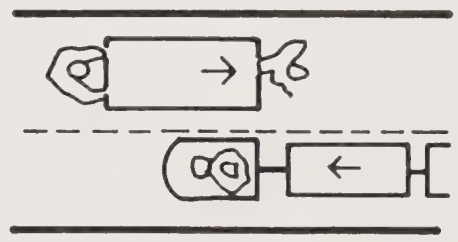
PROCEDURE FOR ESTABLISHING CORRIDOR WIDTHS

A. Passing conditions

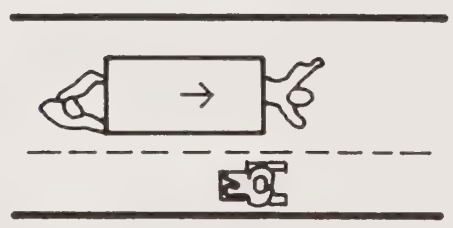
When considering whether the passing of particular components should be designed for, it is necessary to consider the frequency and the importance of the movements. For example in certain corridors where bed movement is infrequent it might be acceptable to allow space for movement of the bed only, as any other traffic could temporarily wait until the bed had passed. Alternatively the emergency movement of a patient in bed to an operating theatre should not be impeded by other traffic.

DETERMINATION OF CRITICAL PASSING CONDITIONS

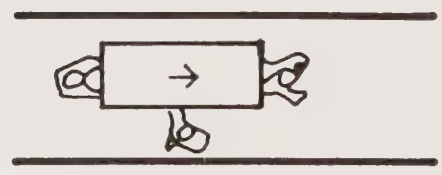
1. Identify the large components that need to use the corridor, eg beds, tugs and trains, large trolleys.



2. Consider whether any of these need to pass. If they do, identify the critical condition (eg two beds passing, a bed passing a train). Add lane width dimensions (see page 21) to establish corridor width.

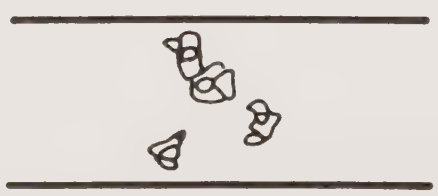


3. If space to allow two large components to pass is not required — consider whether any large components have to pass small components such as wheelchairs and people. Add lane width dimensions to establish corridor width.

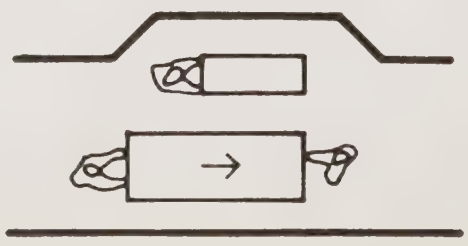


4. If space for the largest component passing another component is not to be allowed for, then the notional corridor width of that component becomes the corridor width.

NOTE: Where a corridor has to accommodate large numbers of pedestrians (and smaller components) this must also be taken into account.



The use of lay-bys and one-way traffic systems may also need consideration as well as the '*other factors*' influencing width of corridors outlined in Section B.



B.Other factors

In addition to the requirements for straight movement and passing, other factors may influence choice of corridor width ie-

90° BENDS (INCLUDING T JUNCTIONS) — turning large components around 90° bends may result in increased corridor width requirements near the bend. The use of chamfers on corners also has an effect on the width requirements.

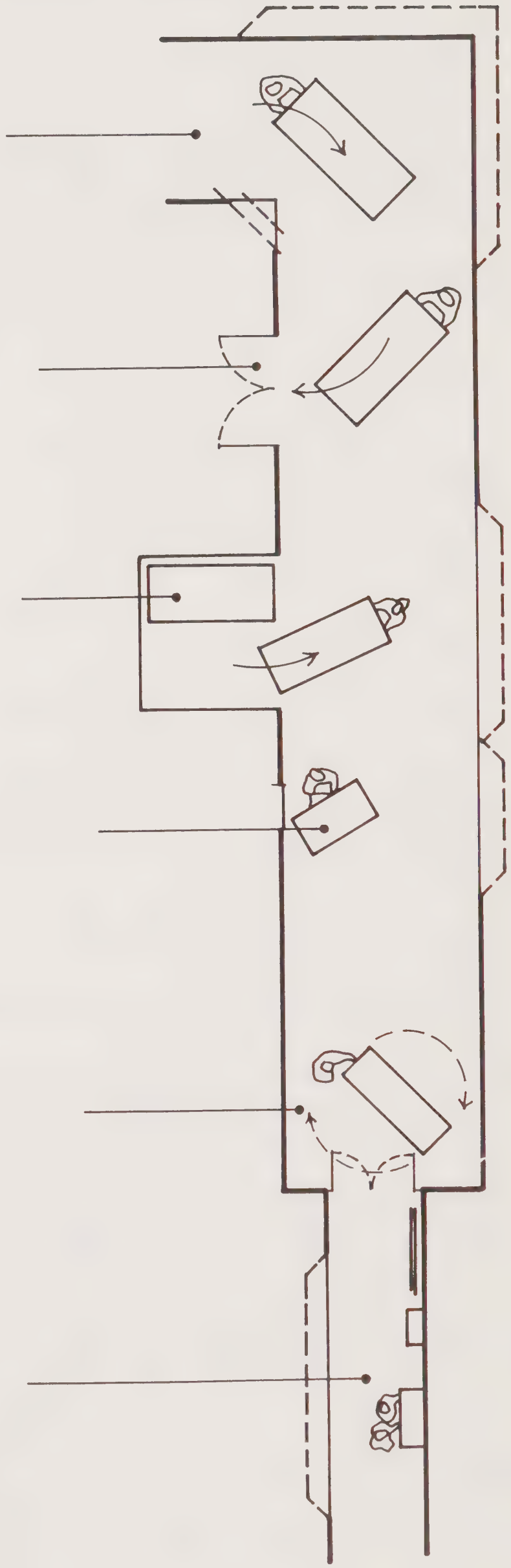
TURNING INTO AND OUT OF DOORS (and narrow openings) — this may result in increased width requirements to allow for turning. Width of opening affects amount of turning space required.

PARKING BAYS — in addition to the additional space for the actual parking bays, manoeuvring space may be required especially where large components are parked at 90° to a corridor wall.

LOADING/UNLOADING — where loading/unloading takes place either in relation to a parking bay or at certain points along the corridor, failure to provide sufficient space can interrupt traffic flow.

CUL-DE-SACS — where components have to be turned through 180° at the end of a corridor (or at a specific point along a corridor) space for turning may exceed width required for straight movements.

OTHER ACTIVITIES AND FITTINGS — such as handrails, radiators, hose reels and activities generated by fittings eg use of vending machines, should be allowed for (also activities described in paragraphs 26–30 of this building note).



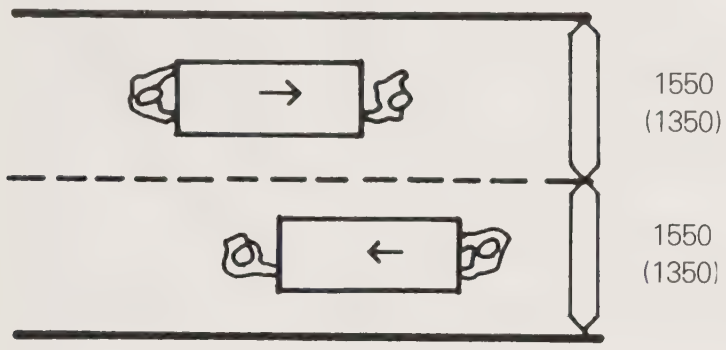
EXAMPLES

The following worked examples show how, having arrived at the critical passing conditions, overall corridor widths can be calculated. (see also 'DIMENSIONS' page 21).

Example (1a)

Critical passing condition — *2 beds passing*

The overall width required is dependant on the frequency and importance of the bed movements. By reference to the 'BED — straight movement' drawings, the following lane widths (adjacent to a wall) are applied:



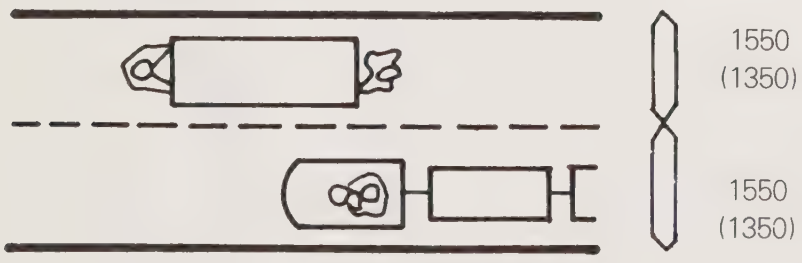
CORRIDOR WIDTH	APPLICATION
1550 + 1550 = 3100	Where bed passing is frequent and/or important
1550 + (1350) = 2900	Where bed passing is infrequent and speed of movement is not significant

NOTE: If (1350) + (1350) = 2700 is used, passing is possible but only with extreme care. If one bed can stop to allow another bed to pass 1550 + 1060 = 2610 or (1350) + 1060 = 2410 may be adequate.

Example (1b)

Critical passing condition — *a bed passing a tug and trolley train.*

By reference to the 'BED and TUGS and TRAINS — straight movement' drawings, the following lane widths (adjacent to a wall) are applied:



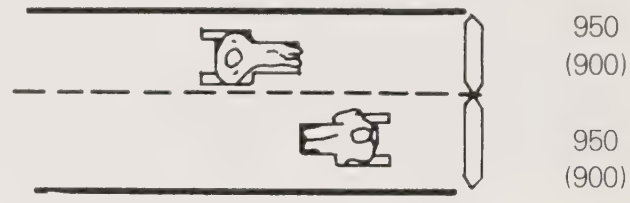
CORRIDOR WIDTH	APPLICATION
1550+1700=3250	Where passing is frequent
1550 + (1450) = 3000	Where passing is infrequent

NOTE: If (1350) + (1450) = 2800 is used, passing is possible but only with extreme care.

Example (2a)

Critical passing condition — *2 independent wheelchair users passing.*

By reference to the 'WHEELCHAIR — straight movement' drawings, the following lane widths (adjacent to a wall) are applied:



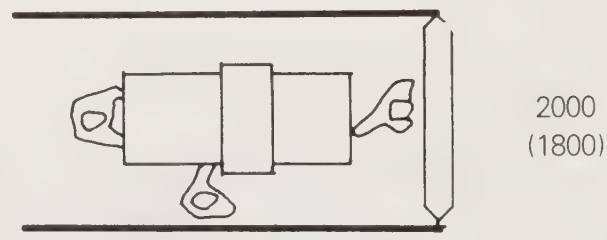
CORRIDOR WIDTH	APPLICATION
950 + 950 = 1900	Where passing is frequent
950 + (900) = 1850	Where passing is infrequent

NOTE: If (900) + (900) = 1800 is used, passing is possible but only with extreme care.

Example (2b)

Critical condition — *movement of bed with attachments and one side attendant.*

In this case the notional corridor width dimension taken from the relevant 'BED — straight movement' drawing should be applied:

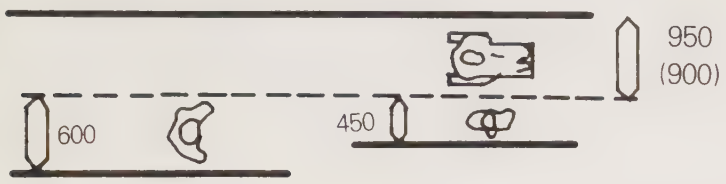


CORRIDOR WIDTH	APPLICATION
2000	Frequent bed movement
(1800)	Infrequent bed movement

NOTE: Notional corridor widths are the clear spaces required for movement only ie the actual corridor width may need to be wider to accommodate wall-mounted items. However, when considering bed movement where handrails are fitted, an additional allowance for the handrail (ie 50mm–75mm) will not be required where the space adjacent to the wall is occupied by a side attendant or high-level orthopaedic attachments are used. This is because these conditions can accommodate a small obstruction at 900mm above floor level.

Example (2c)

Critical passing condition — *independent wheelchair user passing a person walking*



CORRIDOR WIDTH	APPLICATION
950 + 600 = 1550	Where passing is frequent
(900) + 600 = 1500	Where passing is infrequent
950 + 450 = 1400	Where the person stands aside

Beds

Notes

1. The data sheets give the space requirements for the movements of King's Fund type beds with or without bed attachments including orthopaedic attachments.

2. Bed movement is likely to be a particularly critical factor in establishing corridor dimensions in and between wards and those areas such as X-ray and Operating departments where patients are transported on their beds.

3. Space requirements are also given for the movement of beds with one or two side attendants which may be critical in some areas.

4. The restricted (bracketed) dimensions are the minima to allow emergency evacuation, but damage to building fabric and beds is likely to occur in view of the need to move quickly.

5. Where patients are normally transported on trolleys eg in older hospitals and within certain departments such as A & E, see, 'PATIENT trolley' sheets.

6. See page 24 for examples of bed passing conditions.

UNLESS OTHERWISE STATED, ALL DIMENSIONS AND SPACE ALLOWANCES IN THIS DOCUMENT THAT ARE CONCERNED WITH PATIENTS BEDS HAVE BEEN DERIVED FROM THE KING'S FUND SPECIFICATION.

WHEN OTHER TYPES OF BED ARE CONSIDERED THEIR DIMENSIONS *MUST* BE COMPARED TO THE KING'S FUND BED. IF THE BED DIMENSIONS ARE GREATER, ALLOWANCES FOR CIRCULATION, BOTH HORIZONTAL AND VERTICAL (EG LIFTS), AND ROOM SIZES, WILL NEED TO BE INCREASED.

Activities:
Straight movement of bed without side attendants.

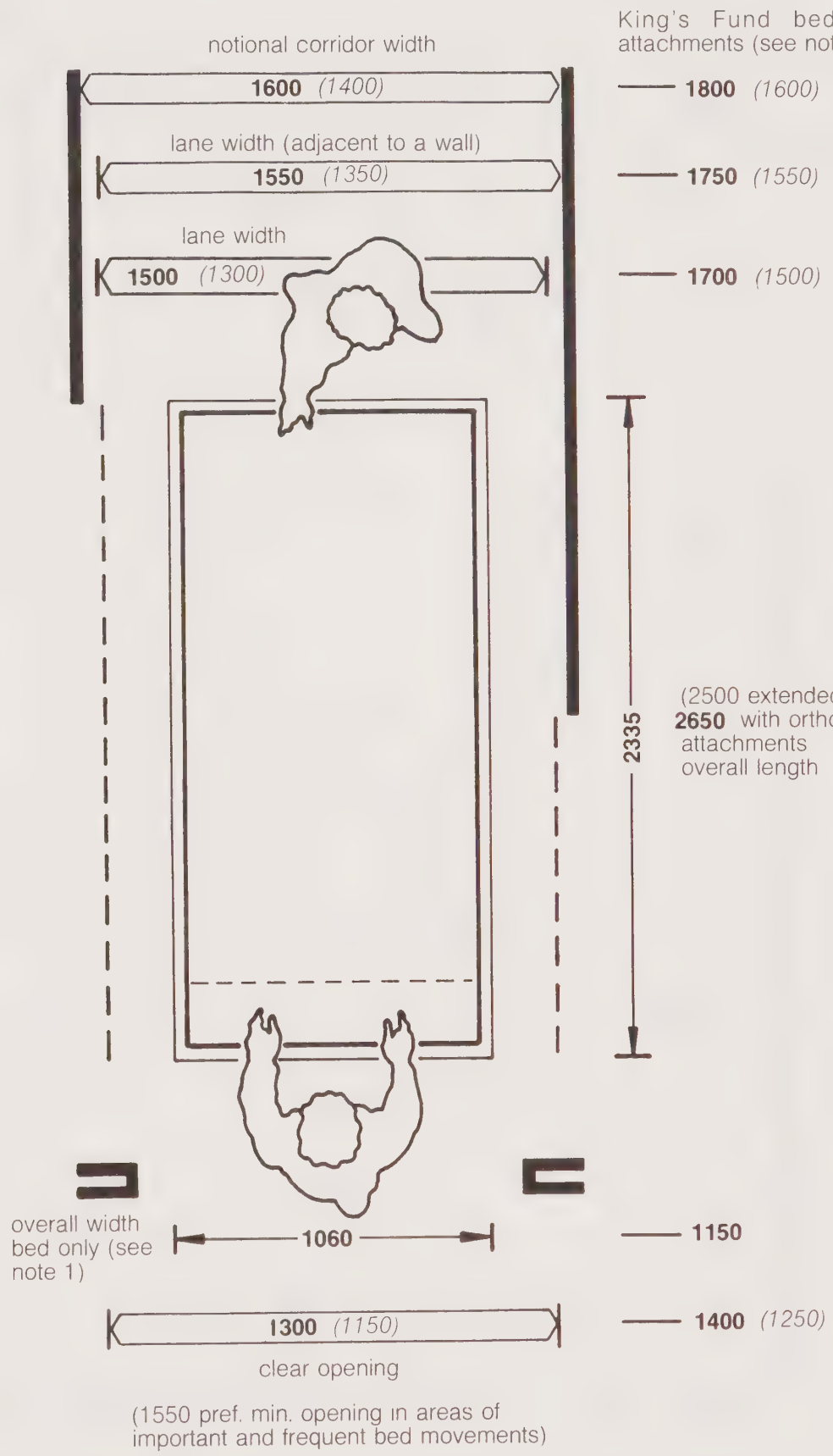
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

3A3

Bed

King's Fund specification fixed and variable height types.

Users:
1 or 2 staff moving bed without side attendants.



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Component envelope shown will accept King's Fund specification beds, extended and with buffer and side rails.

2. Othopaedic attachments: component space for beds with orthopaedic attachments varies with type used. Typical dimensions of component spaces with standard types are:
width — 1150 (at high level due to cross beam)
length — 2540 (bed not tilted) 2650 (at maximum tilt)
height — (fixed height bed) — 2010 (bed not tilted) 2290 (at maximum tilt)
height (variable height bed) — 1805-2190 (bed not tilted) 2075-2480 (at maximum tilt).

N.B. Variable height beds are the type generally used with orthopaedic attachments, therefore by reducing the platform height when necessary, a clear height of 1920 is normally acceptable.

3. Restricted width should only be used in areas where bed movement is infrequent. They do however represent acceptable minima for patient evacuation in the event of fire or emergency.

4. Where clinical need dictates that larger equipment is necessary, more generous operating space must be provided.

Activities:
Moving beds through 1500 door set
(doors opening away from corridor)

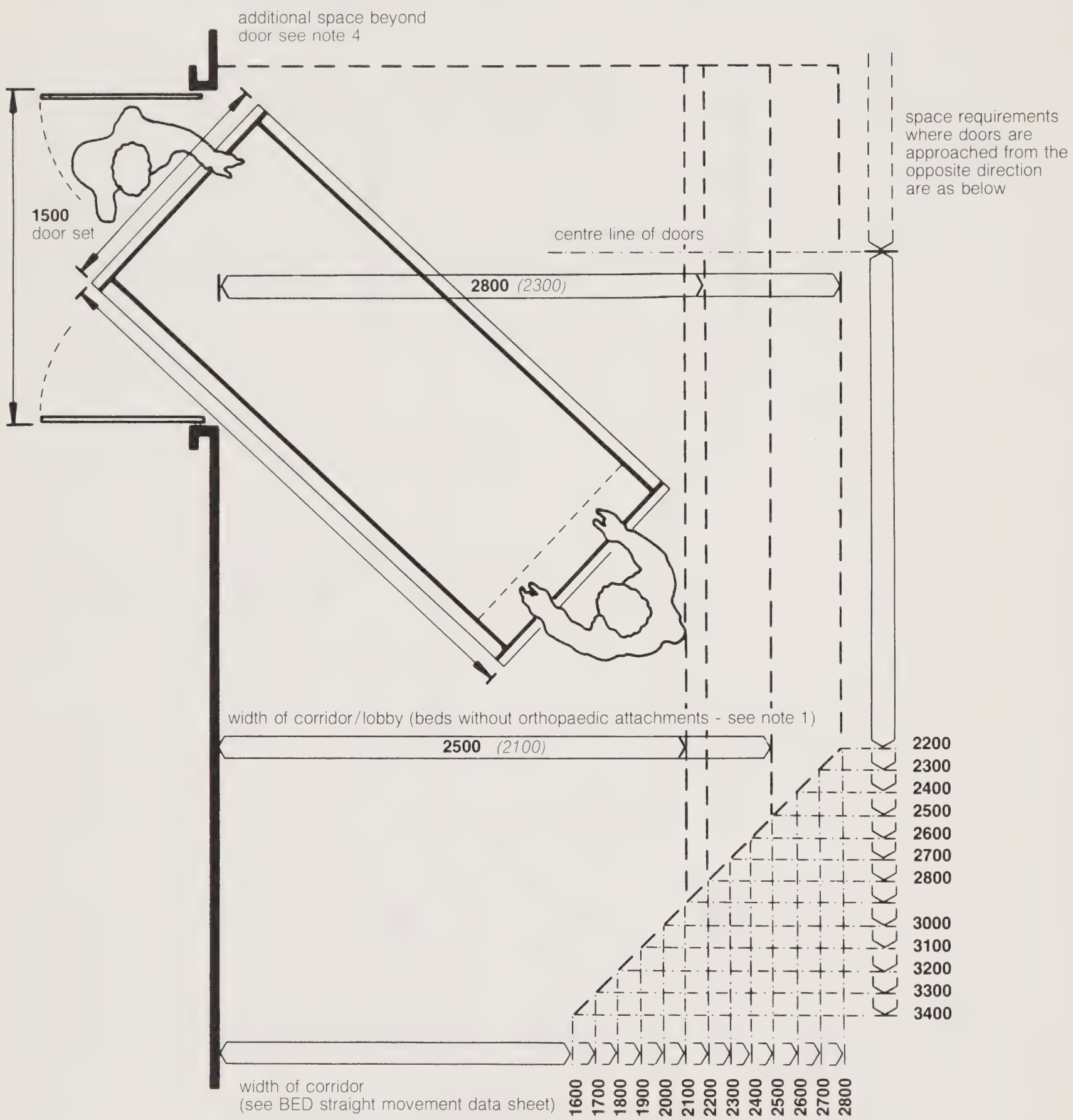
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

3A10

Bed

King's Fund specification
fixed and variable height types.

Users:
2 Staff (no space for attendants specifically allowed).



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Component envelope: will accept King's Fund specification beds, extended and with buffer and side rails.

2. Orthopaedic attachments: component envelope for beds with orthopaedic attachments varies with type used. Typical dimensions of component space with standard types are:
width - 1150 at high level due to cross beams
length - 2540 (bed not tilted) 2650 (at maximum tilt).

3. Restricted dimensions should only be used in areas where bed movement is infrequent. They do however represent acceptable minima for patient evacuation in the event of fire or emergency.

4. Additional spcae beyond door in cul-de-sac situation does not significantly improve ease of manoeuvrability with 2 staff controlling bed movement. However, additional space of 900 (600) at side of door is required where bed is pushed by one person only. This is to allow pivoting after passing through door opening into lobby.

Activities:
Straight movement of bed with attendants on both sides.

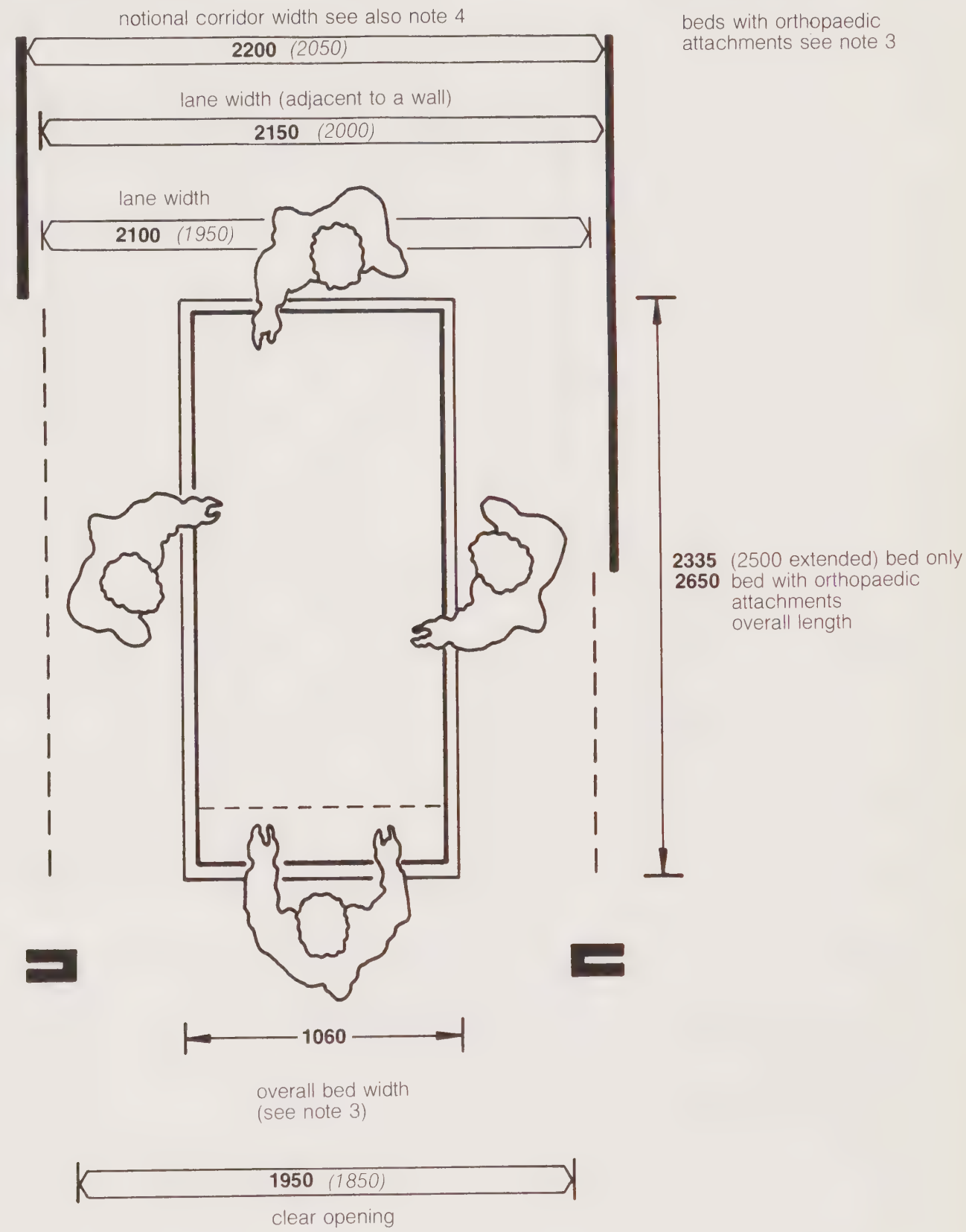
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Bed

3A4

King's Fund specification fixed and variable height types.

Users:
1 or 2 staff moving bed attendants on both sides.



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Component envelope shown will accept King's Fund specification beds, extended and with buffer and side rails.

2. Orthopaedic attachments: component space for beds with orthopaedic attachments varies with type used. Typical dimensions of component spaces with standard types are:
width — 1150 (at high level due to cross beam)
length — 2540 (bed not tilted). 2650 (at maximum tilt)
height (fixed height bed) — 2010 (bed not tilted) 2290 (at maximum tilt)
height (variable height bed) — 1805-2190 (bed not tilted). 2075-2480 (at maximum tilt).

N.B. Variable height beds are the type generally used with othopaedic attachments, therefore by reducing the platform height when necessary, a clear height of 1920 is normally acceptable).

3. The space for straight movement where one or more side attendants are positioned either side of the bed is the same for beds with or without orthopaedic beams. This is because the attendant space requirement exceeds the overhang of the orthopaedic beams at high level.

4. The max. length of passages of restricted width is difficult to assess. Subjective responses suggest that 6 or 7 side steps by side attendants are tolerable — ie: a restricted corridor length of approx. 2500. This should not be significantly exceeded.

Activities:
Moving beds around a 90⁰ corner
(no space for attendants specifically allowed)

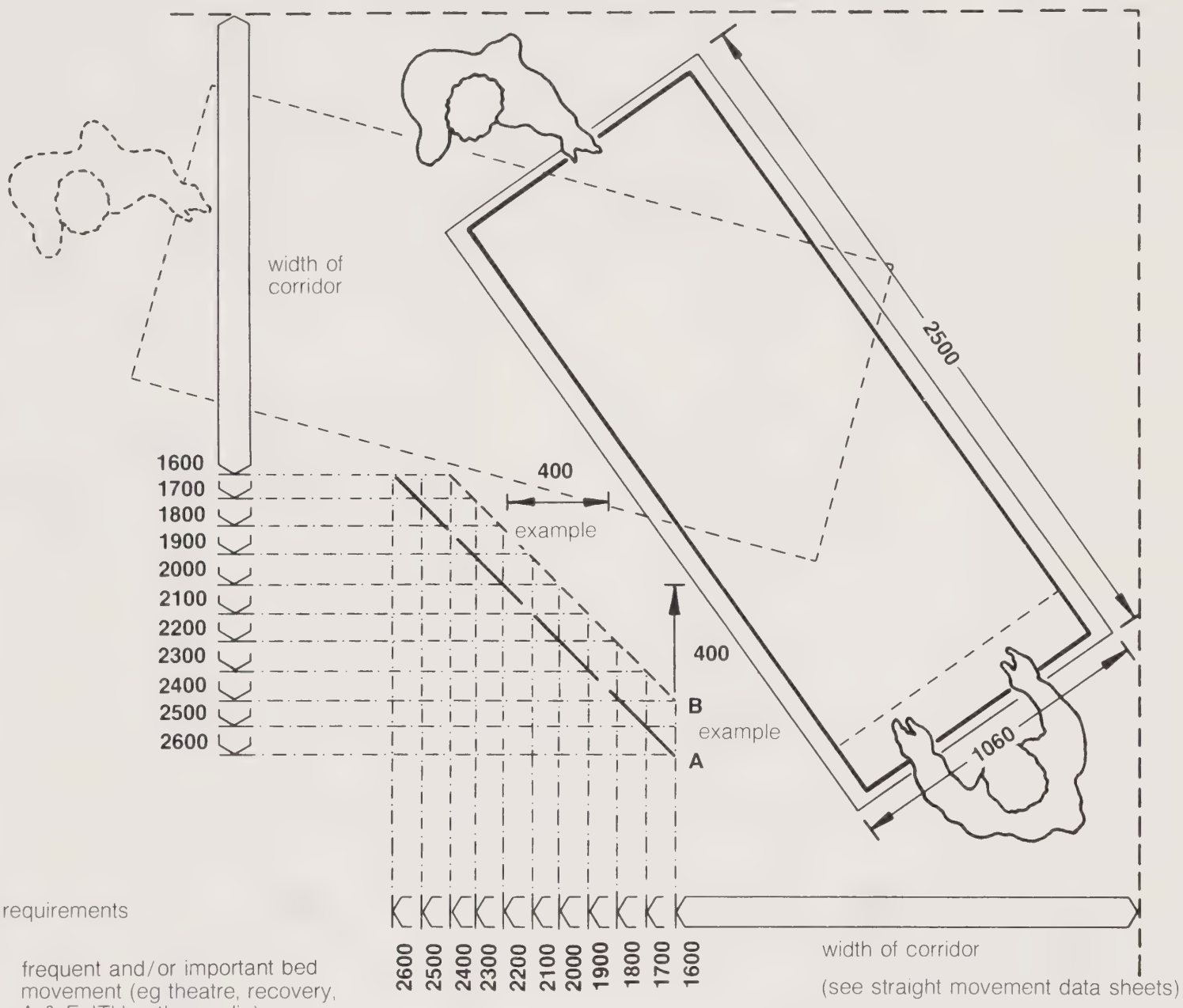
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Bed

3A5

King's Fund specification
fixed and variable height types

Users:
1 or 2 staff



Chamfer requirements

A-A frequent and/or important bed movement (eg theatre, recovery, A & E, ITU, orthopaedic)

B-B infrequent bed movement (also acceptable for emergency evacuation)

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

For given corridor widths and frequency of bed movement, use diagram to establish
A need for a chamfered corner
B dimensions of chamfer

Examples:
— both corridors 1600 wide infrequent bed movement —
800 x 800 chamfer
— 1800 corridor meeting 2000 corridor, medium frequent movements
— 400 x 400 chamfer
— 1800 corridor meeting 2400 corridor — no chamfer
required for any frequency of use.

1. Component envelope will accept King's Fund specification beds, extended and with buffer and side rails.

2. Orthopaedic attachments: component space for beds with orthopaedic attachments varies with type use. Typical dimensions of component spaces with standard types are:
width — 1150 at high level due to cross beams
length — 2540 (bed not tilted), 2650 (at maximum tilt)
height (fixed height bed) — 2010 (bed not tilted), 2290 (at maximum tilt)
height (variable height bed) — 1805-2190 (bed not tilted), 2075-2480 (at maximum tilt)

N.B. Variable height beds are the type generally used with orthopaedic attachments, therefore by reducing the platform height when necessary, a clear height of 1920 is acceptable for normal bed movements.

Activities:
Straight movement of bed with one side attendant.

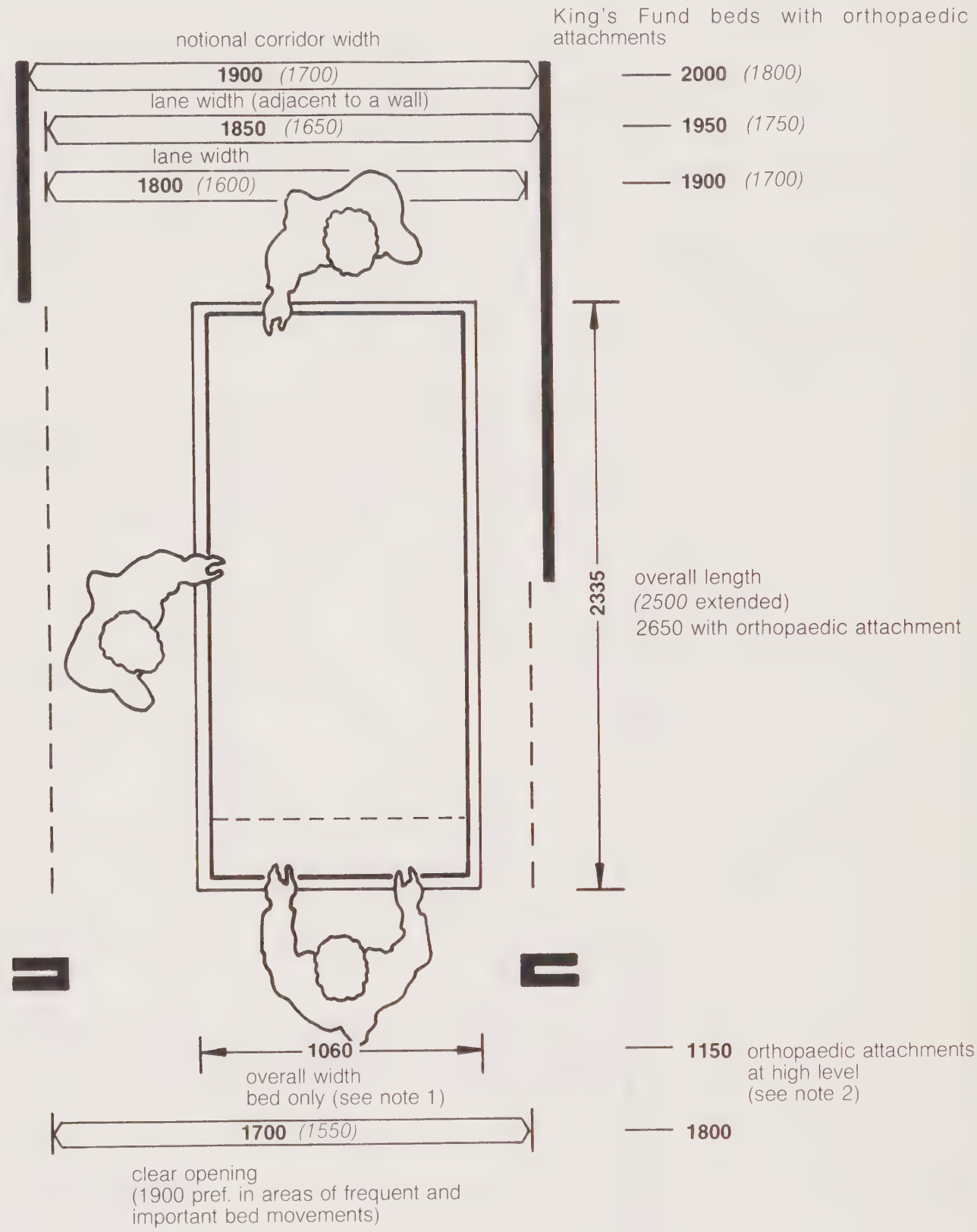
DHSS **Ergonomic data bank:**
Component-user data sneet, not to scale.

Bed

3A11

King's Fund specification fixed and variable height types.

Users:
1 or 2 staff moving bed with one side attendant.



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Component envelope shown will accept King's Fund specification beds, extended and with buffer and side rails.

2. Orthopaedic attachments; component space for beds with orthopaedic attachments varies with type used. Typical dimensions of component spaces with standard types are:
width — 1150 (at high level due to cross beam)
length — 2540 (bed not tilted). 2650 (at maximum tilt)
height (fixed height bed) — 2010 (bed not tilted). 2290 (at maximum tilt)
height (variable height bed) — 1850-2190 (bed not tilted). 2075-2480 (at maximum tilt).

N.B. Variable height beds are the type generally used with orthopaedic attachments; therefore by reducing the platform height when necessary, a clear height of 1920 is normally acceptable.

3. Restricted widths should only be used in areas where this type of movement occurs infrequently.

4. For min. widths for patient evacuation in the event of fire or emergency, see K.F. Bed — straight movement without side attendants, data sheet.

5. Where clinical need dictates that larger equipment is necessary, more generous operating space may be needed. Where this occurs at high level on the attendant side only no increase will be necessary, but if symmetrically located at high level an increase not less than 0.5 x the increased width will be required.

6. The max. length of passages of restricted width is difficult to access. Subjective responses suggest that 6 or 7 side steps by side attendants are tolerable — i.e. a restricted corridor length of approx. 2500. This should not be significantly exceeded.

Activities:
Moving beds through 1900 door set
(doors opening away from corridor)

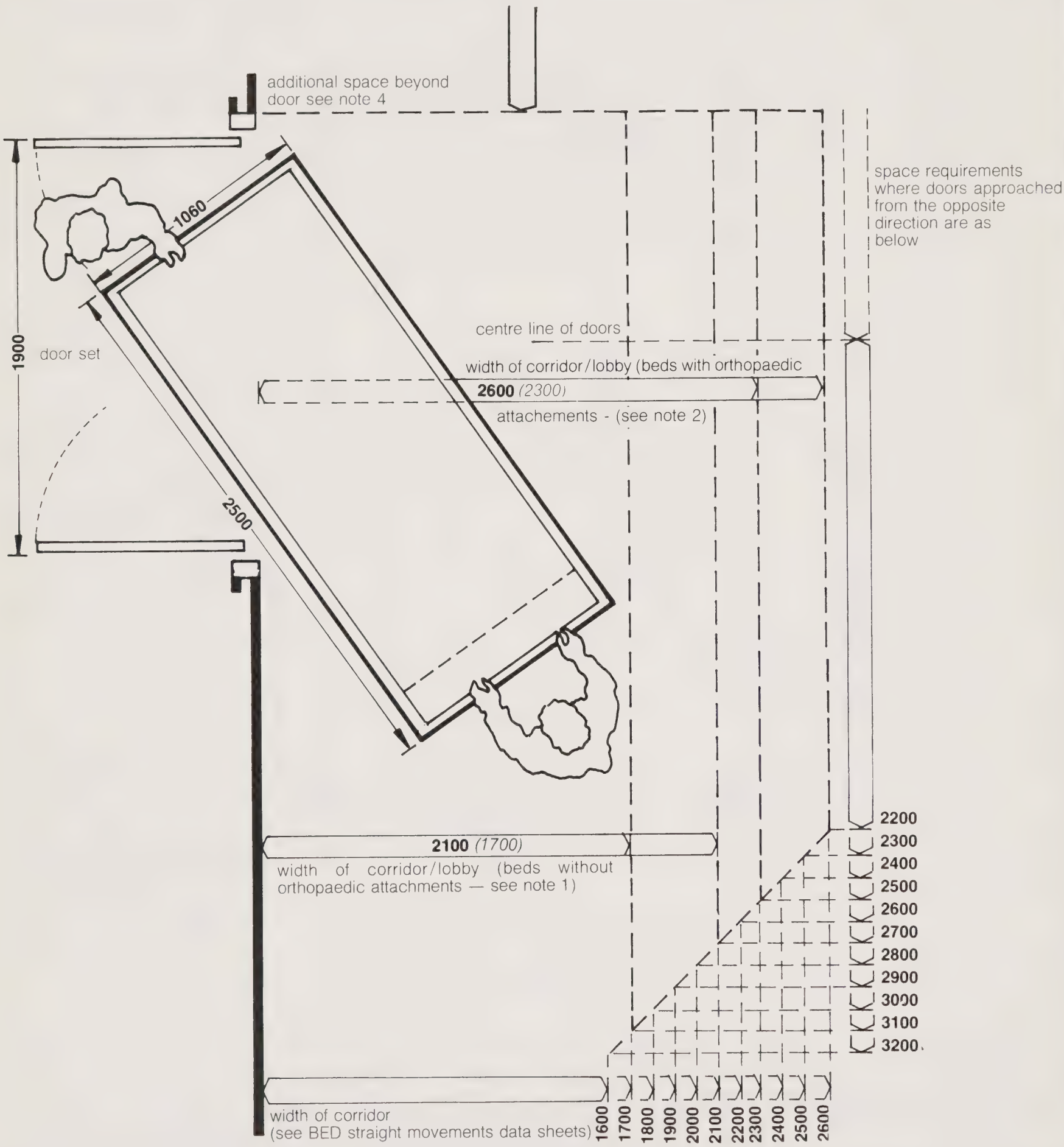
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Bed

3A7

King's Fund specification
fixed and variable height types

Users:
2 staff (no space for attendants specifically allowed)



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Component envelope: will accept King's Fund specification beds, extended and with buffer and side rails.

2. Orthopaedic attachments: component envelope for beds with orthopaedic attachments varies with type used. Typical dimensions of component space with standard types are:
width — 1150 at high level due to cross beams
length — 2540 (bed not tilted) 2650 (at maximum tilt)

3. Restricted dimensions should only be used in areas where bed movement is infrequent. They do however represent acceptable minima for patient evacuation in the event of fire or emergency.

4. Additional space beyond door in cul-de-sac situation does not significantly improve ease of manoeuvrability with 2 staff controlling bed movement. However, additional space of 700 (450) at side of door is required where bed is pushed by one person only. This is to allow pivoting after passing through door opening into lobby.

Activities:
Rotating bed through 180°

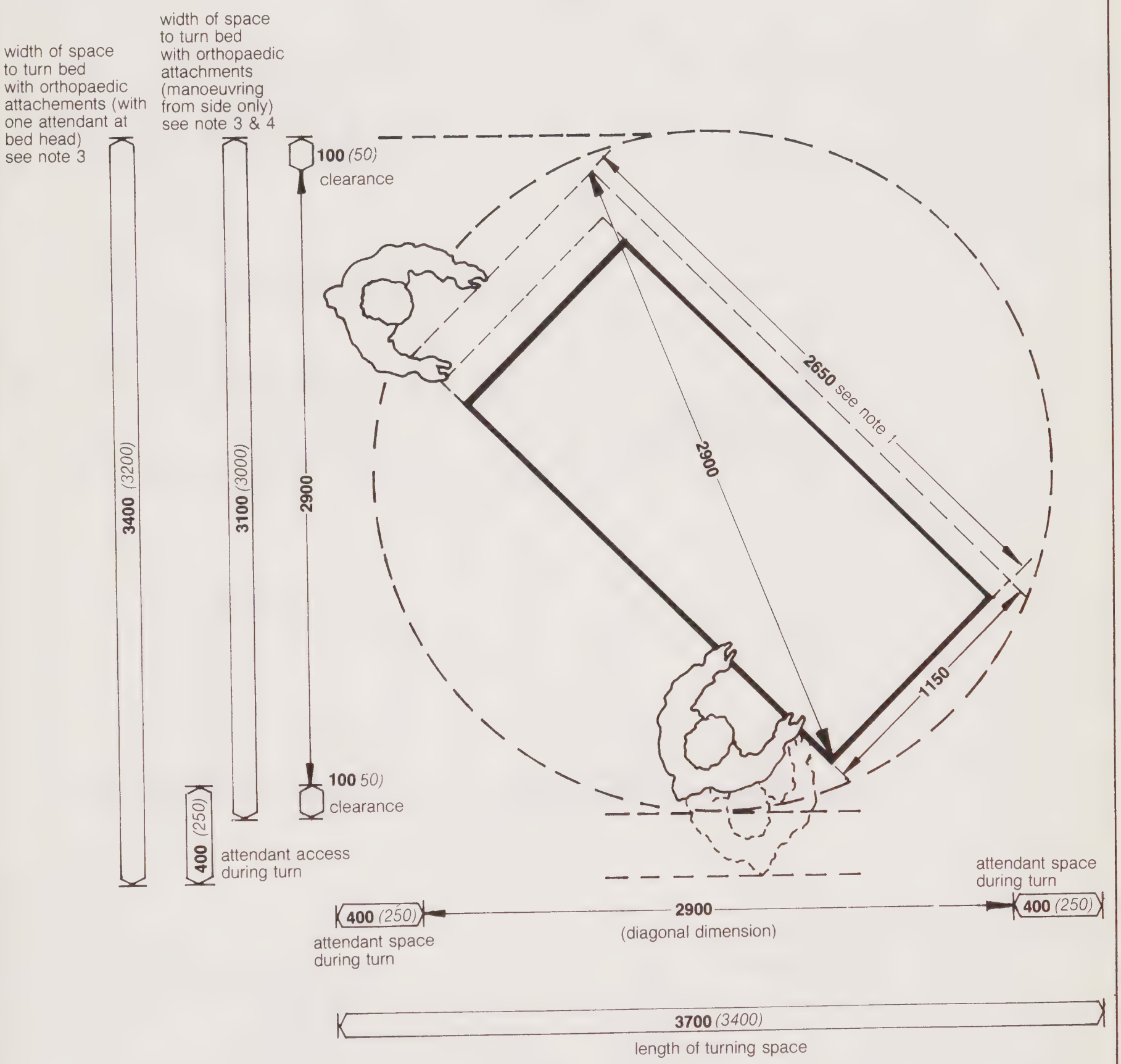
DHSS **Ergonomic data bank:**
Component user data sheet, not to scale

Bed

3A6

King's Fund specification
with orthopaedic attachements

Users:
2 Staff (moving bed) and up to 2 attendants


width of space to turn bed with orthopaedic attachements (with one attendant at bed head) see note 3
width of space to turn bed with orthopaedic attachments (manoeuvring from side only) see note 3 & 4
100 (50) clearance
3400 (3200)
3100 (3000)
2900
2650 see note 1
2900
1150
100 50) clearance
400 (250)
attendant access during turn
attendant space during turn
400 (250)
2900
(diagonal dimension)
400 (250)
attendant space during turn
3700 (3400)
length of turning space

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Shaded envelope 1150 x 2650 allows for a King's Fund bed plus orthopaedic attachments assuming cross beams 1150 long located at the extremities of a double frame, and including a 300 traction extension. It is possible that some orthopaedic attachments may protrude beyond the envelope and that this may result in the need for some increase in space for turning, particularly if the protruberance is located at or near the corner of the envelope. Such increases must be judged according to specific project needs and particular orthopaedic equipment specifications.

The above dimensions are seen as reasonably representative of old and new equipment in use and have consequently been used as a basis for recommendations on bed movement and turning.

2. Where clinical use dictates that dimensions of the equipment must be greater than those shown above, failure to increases the operating space will result in damage to building fabric and equipment. Also beds may fail to negotiate door openings, bends etc., which would be particularly critical as it may delay or prevent the emergency evacuation of patients.

3. Where space for attendants at the foot and head of the bed is required the overall width of space should be increased to 3700 (3400).

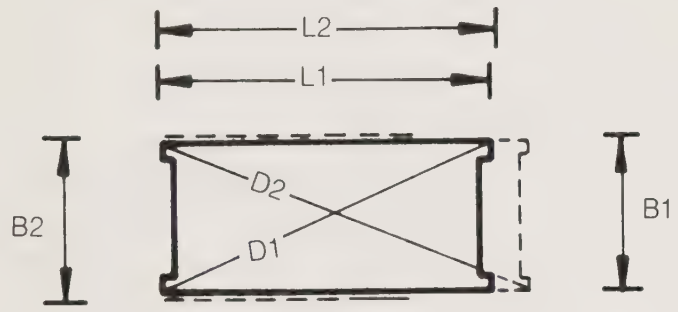
Activities:
Adjustable or fixed height bed sizes (each dimension is the maximum (or min.) for a selected range from different approved manufacturers.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

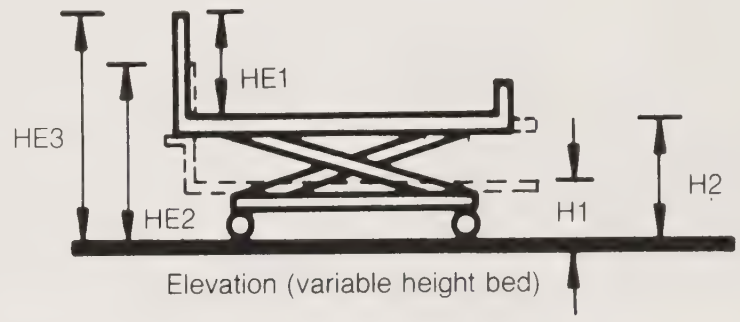
3A2

Bed

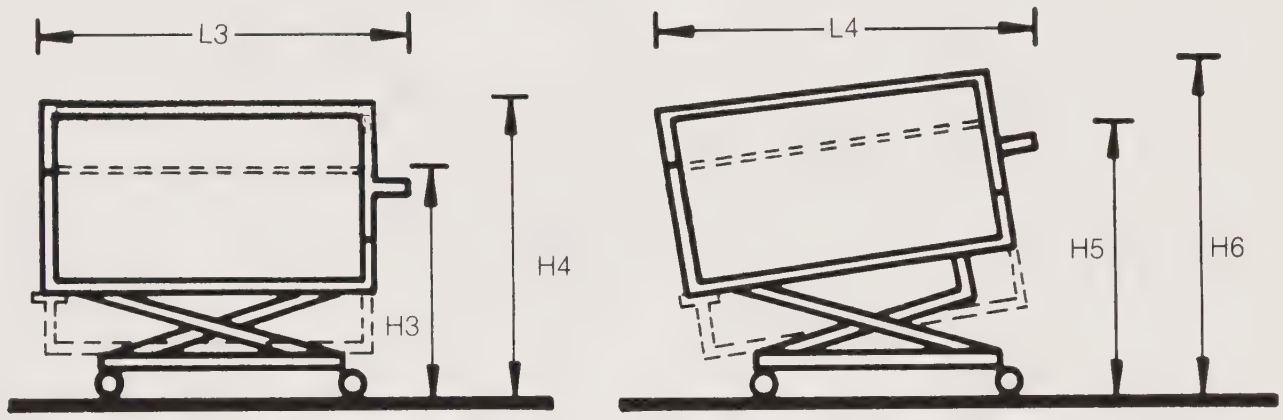
Kings Fund fixed and variable height



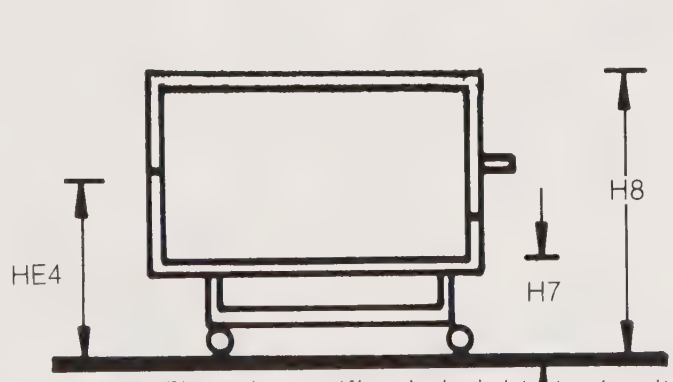
Plan

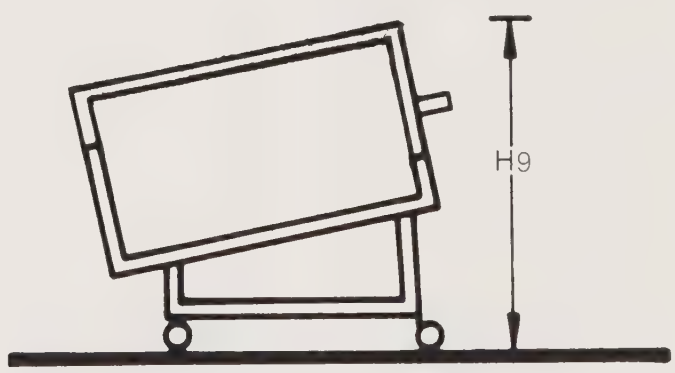


Elevation (variable height bed)



Elevations (variable height) bed with orthopaedic attachments





Elevations (fixed height bed with orthopaedic attachments)

Notes:

1. Overall diagonal dimenisons on plan of orthopaedic beams are given by D3 and D4.

2. Orthopaedic cross beam dimensions may exceed 1120 upon which bed movement studies are based. Therefore, where appropriate a proportional increase in user space may be required. (This will not apply where side attendant space is provided).

L1	**2235**	Add 100 where head end buffer rail is fitted	H3	**1805**	Dimensions include allowance for clamps and pulleys
L2	**2400**		H4	**2190**	
L3	**2540**		H5	**2075**	
L4	**2660**	At maximum tilt	H6	**2480**	
D1	**2420**	Add 80 where head end buffer rail is fitted When horizontal	H7	**620**	
D2	**2500**		H8	**2010**	
D3	**2720**		H9	**2290**	
D4	**2900**	When tilted 12°	HE1	**810**	
B1	**960**	Dimensions include corner buffers	HE2	**1205**	With bed in H1 position
B2	**1060**	With side rails (Add 60mm for high level orthopaedic cross beam attachments) see note 2	HE3	**1590**	With bed in H2 position
			HE4	**1410**	
H1	**410**				
H2	**840**				

Patient Trolleys and Hoists

Notes

1. The data sheets show a patient trolley, the size of which is a theoretical maximum so that the space requirements for movement given will allow for most types. (See also notes on 'straight movement' data sheet.)

2. Movement of patients on trolleys is likely to be a critical factor in establishing corridor dimensions within specific departments such as A & E and Operating and also in those hospitals where patients are not moved on beds.

Activities:
Straight movement of patient trolley

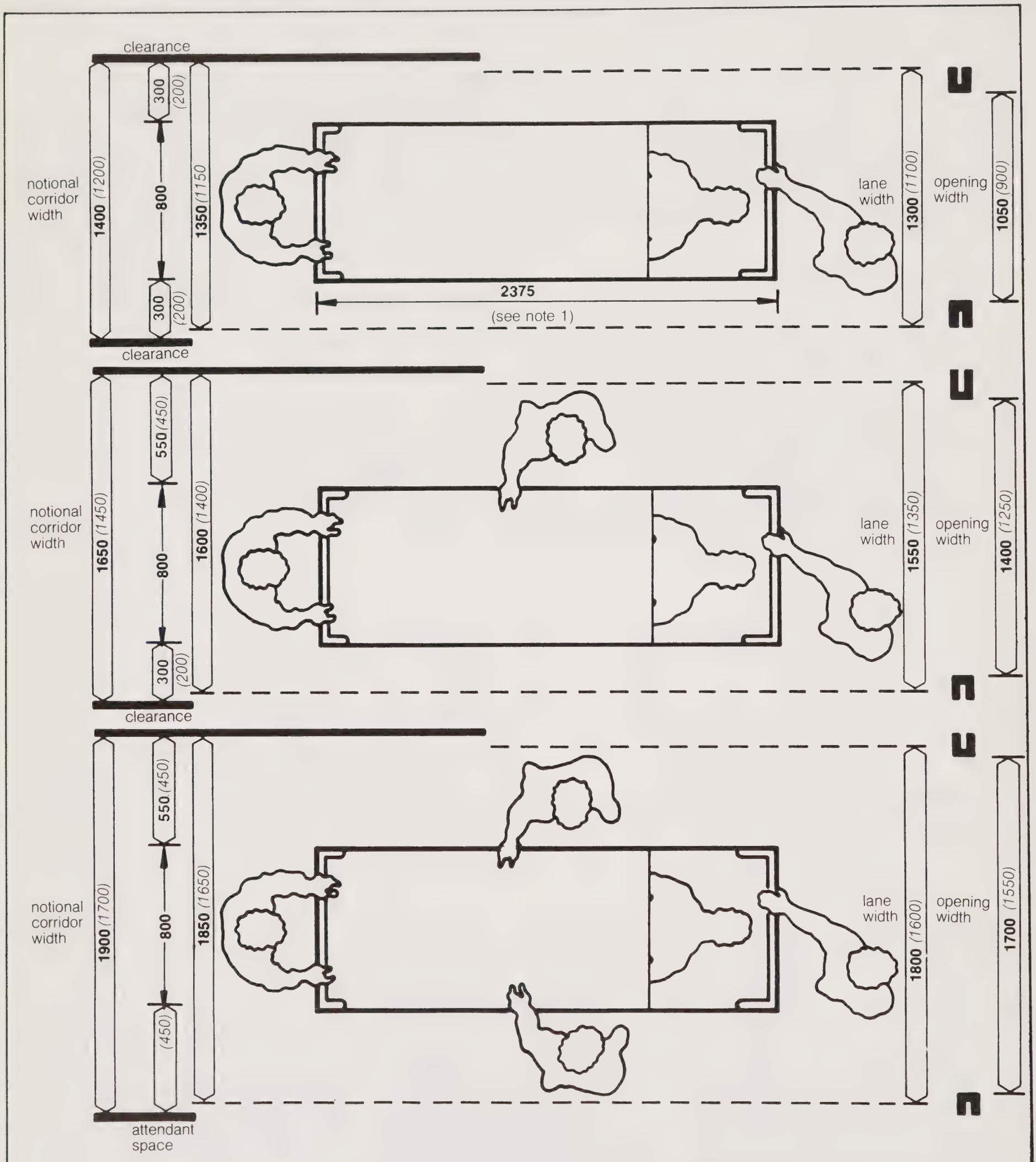
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Patient trolley

8B3

Various types (see note 1)

Users:
1 or 2 staff moving trolley
with or without side attendants



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

ments given above will accommodate most types of commonly occurring patient trolleys (ie. general types with and without side guards and adjustable head rest, transfer top type; X-ray top type; accident, X-ray, tilting, stretcher trolley and mortuary concealment trolley etc.)

Notes:
1. Type of patient trolley — space require-

Activities:

Moving trolley around 90° bend
(no space for side attendants specifically provided)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

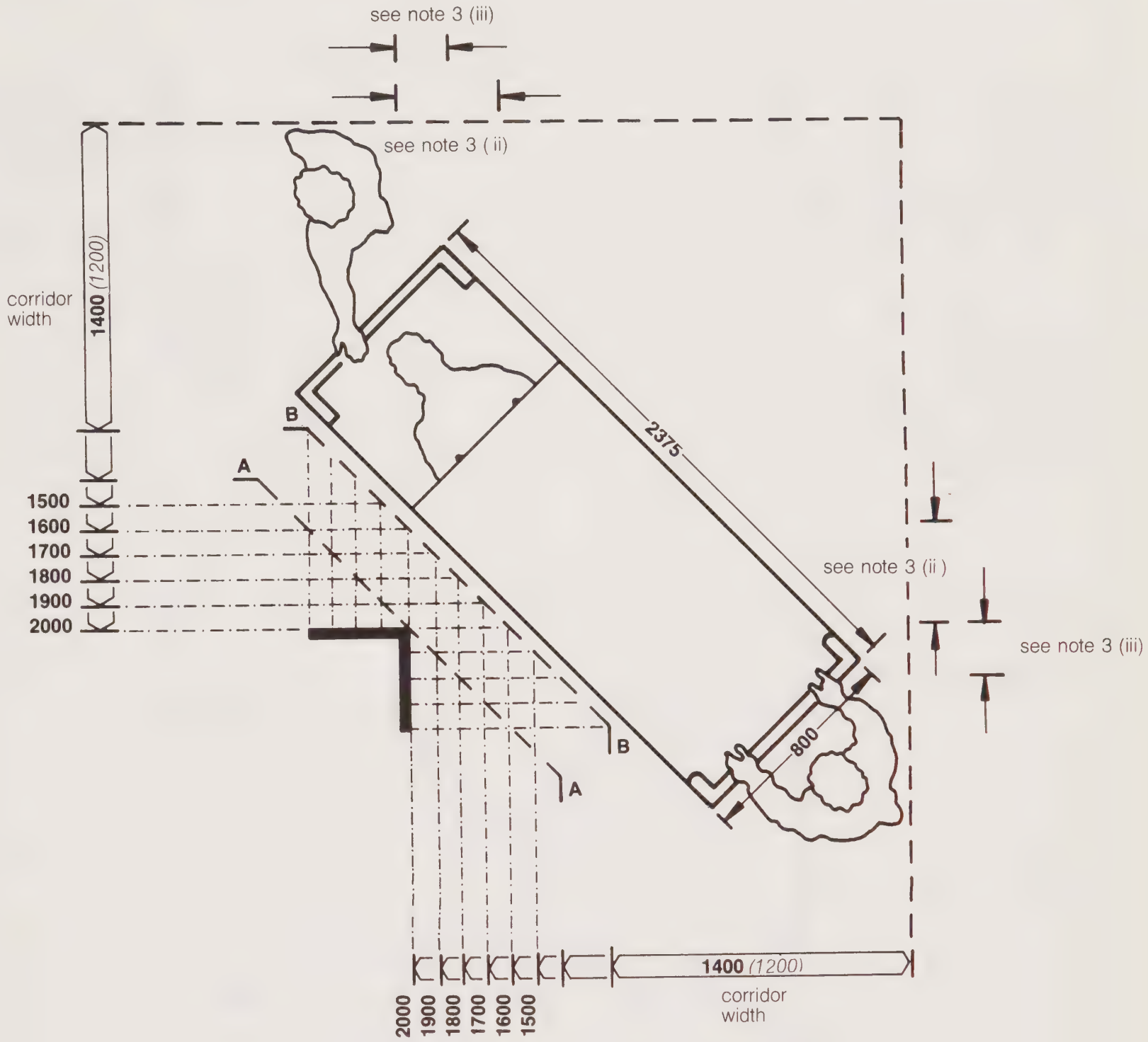
8B4

Patient trolley

Various types (see note 1 & 2)

Users:

1 or 2 staff moving trolley



A—A— frequent and/or important trolley movements (e.g. theatre, A & E, ITU, etc.)
B—B— infrequent trolley movement

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Type of patient trolley — space requirements given above will accommodate most types of commonly occurring patient trolleys (ie. general types with and without side guards and adjustable head rest, transfer top type); X-ray top type; accident, X-ray, tilting, stretcher trolley and mortuary concealment trolley etc.)

2. Loaded trolley as shown is assumed to have 2 fixed and 2 freely rotating castors.

3. Dimensions of chamfers — example:
i) both corridors 2000 wide — no chamfer required for either category of movement
ii) both corridors 1600 wide with infrequent trolley movement — 400 x 400 chamfer required.
iii) 1800 corridor meeting 2000 corridor with frequent trolley movement — 200 x 200 chamfer required.

Activities:
Moving patient trolley through 1900 door set

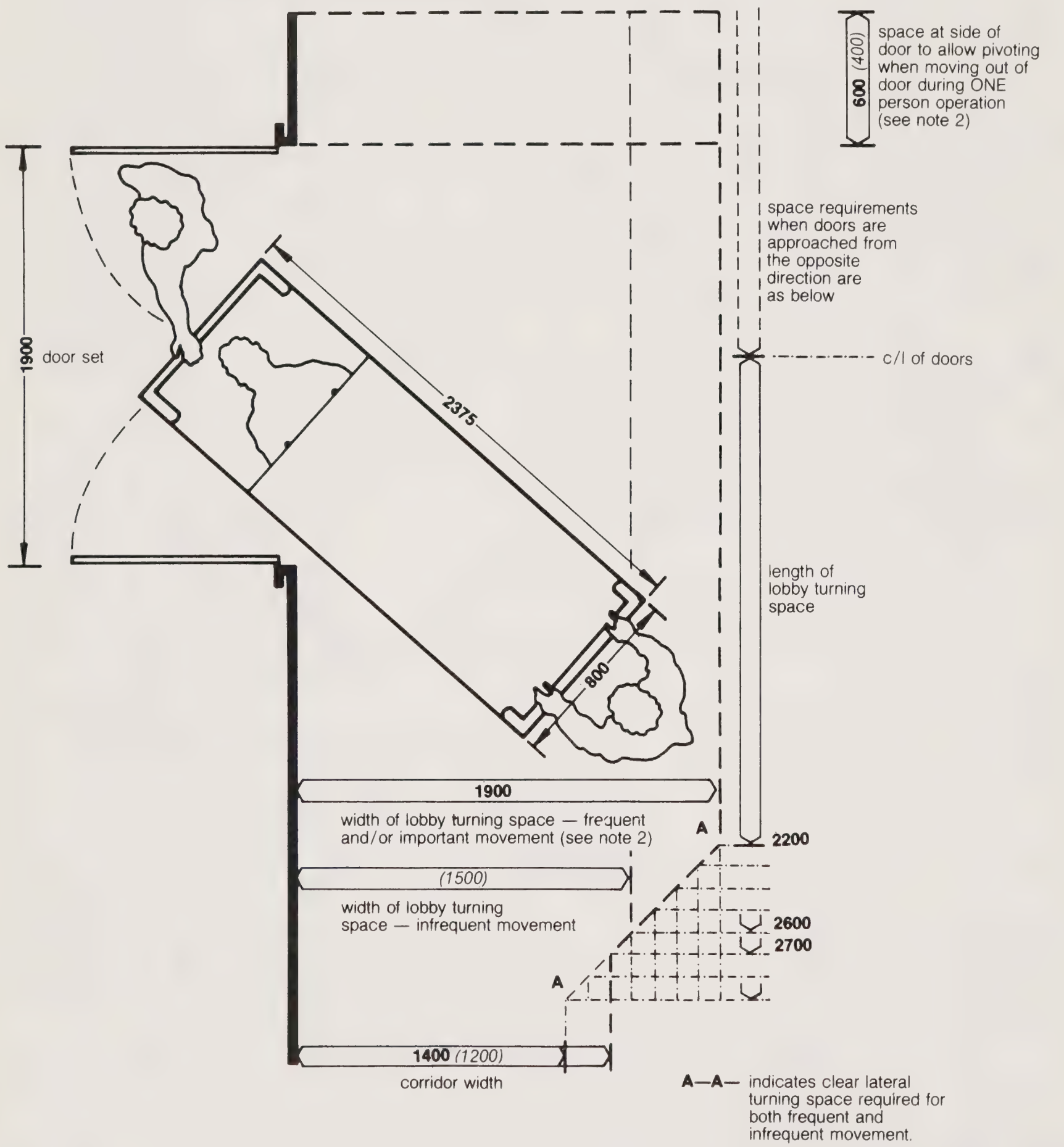
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8 B 2

Patient trolley

Various types (see note 1)

Users:
1 or 2 staff moving trolley


600 (400)
space at side of door to allow pivoting when moving out of door during ONE person operation (see note 2)
space requirements when doors are approached from the opposite direction are as below
1900
door set
2375
800
c/l of doors
length of lobby turning space
1900
width of lobby turning space — frequent and/or important movement (see note 2)
A
2200
(1500)
width of lobby turning space — infrequent movement
2600
2700
A
1400 (1200)
corridor width
A—A— indicates clear lateral turning space required for both frequent and infrequent movement.

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The activity dimensions shown assumes that trolleys moved by 2 persons will have 4 freely rotating castors.

2. 1900 is also the minimum lobby width for both frequent and infrequent movements where the patient trolley is pushed by one person only.

This applies specifically to the action of turning into the door opening.

Activities:
Moving patient trolley through 1500 door set

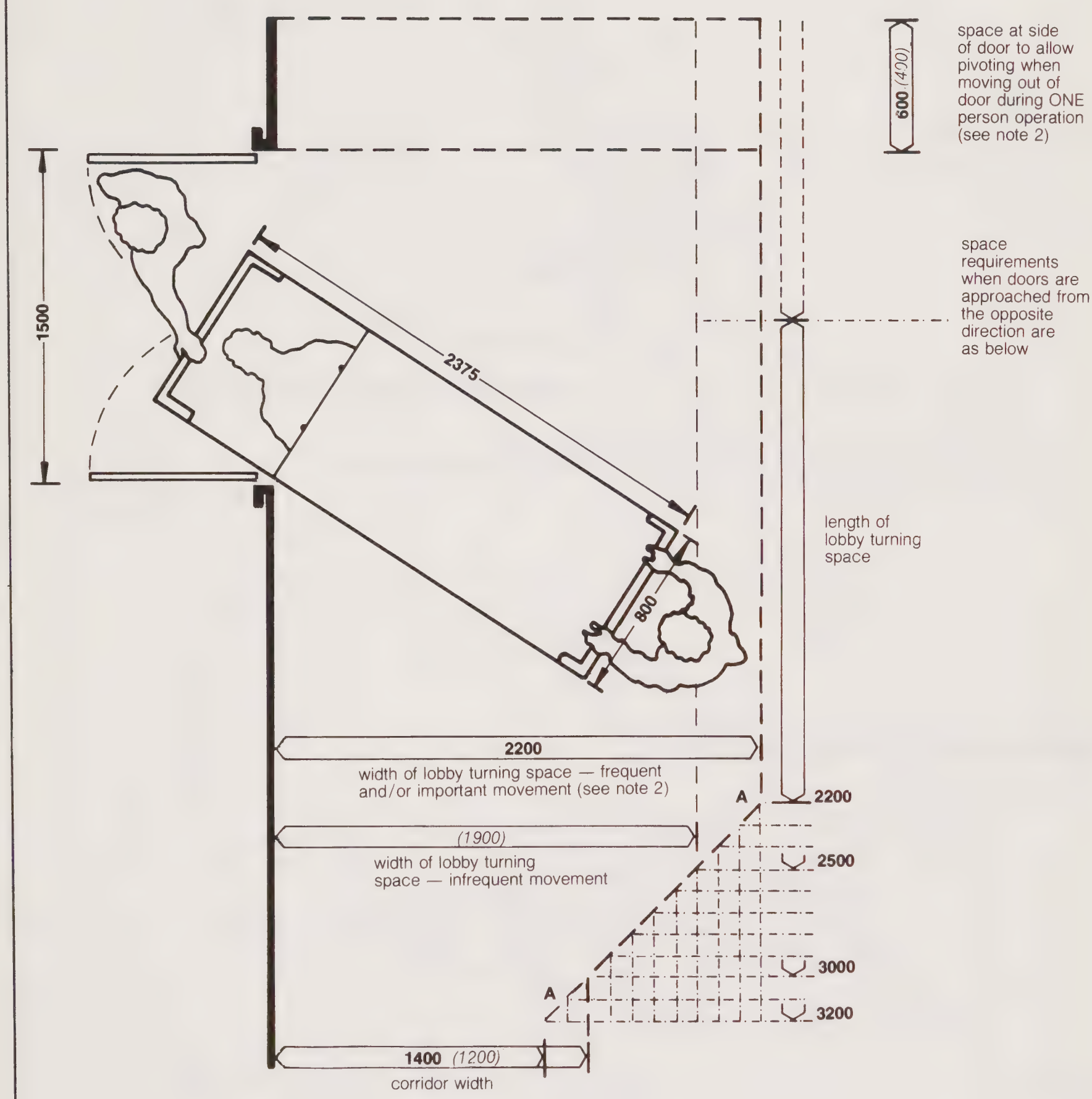
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Patient trolley

8 B 1

Various types (see note 1)

Users:
1 or 2 staff


600 (400)
space at side of door to allow pivoting when moving out of door during ONE person operation (see note 2)
space requirements when doors are approached from the opposite direction are as below
1500
2375
800
length of lobby turning space
2200
width of lobby turning space — frequent and/or important movement (see note 2)
A
2200
(1900)
width of lobby turning space — infrequent movement
2500
3000
A
3200
1400 (1200)
corridor width

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The activity dimensions shown assumes that trolleys moved by 2 persons will have 4 freely rotating castors.

2. 2200 is also the minimum lobby width for both frequent & infrequent movements where the patient trolley is pushed by ONE person only. This applies specifically to the action of turning into the door opening.

Activities:
Straight movement of a patient in a hoist
(eg. to and from a bathroom)

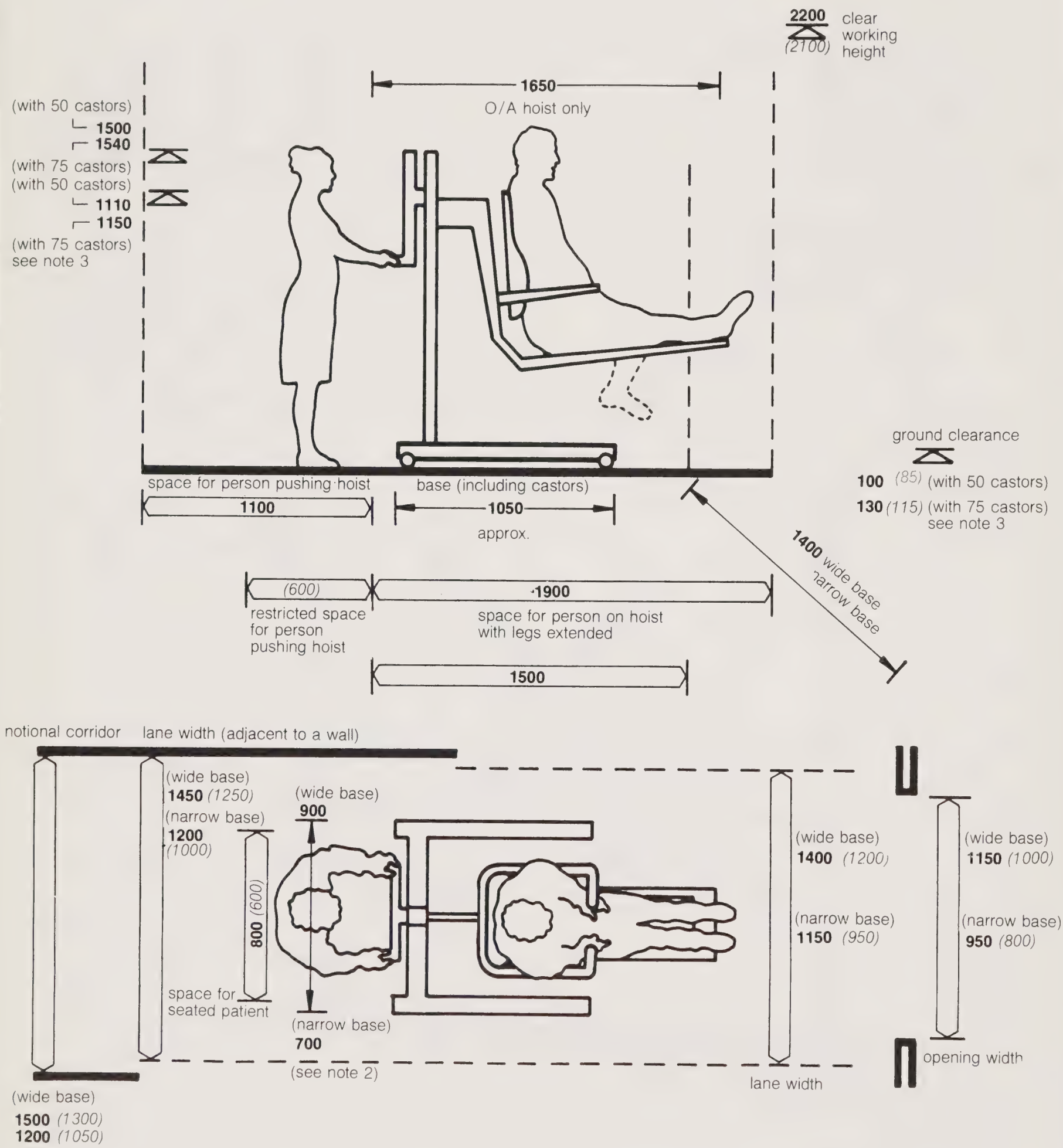
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Patient hoist

8A2

Mobile chair hoist
(with wide or narrow base)

Users:
1 staff (moving hoist)



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Chair type hoists are the type generally used for transporting patients in preferance to sling hoists (sling hoists are however essential for some patients). If sling hoists are used the space requirements for straighter movement will exceed the recommendations shown above.

2. The wider base is preferred because it is more stable in use.

3. The larger 75mm castors are preferred as manoeuvring heavy patients is easier. However greater floor clearance must be available under beds, baths, etc.

Activities:
Space to turn into and out of an opening of minimum width (1150 for wide base hoist and 950 for narrow base hoist)
Space to turn patient hoist round 90° bend

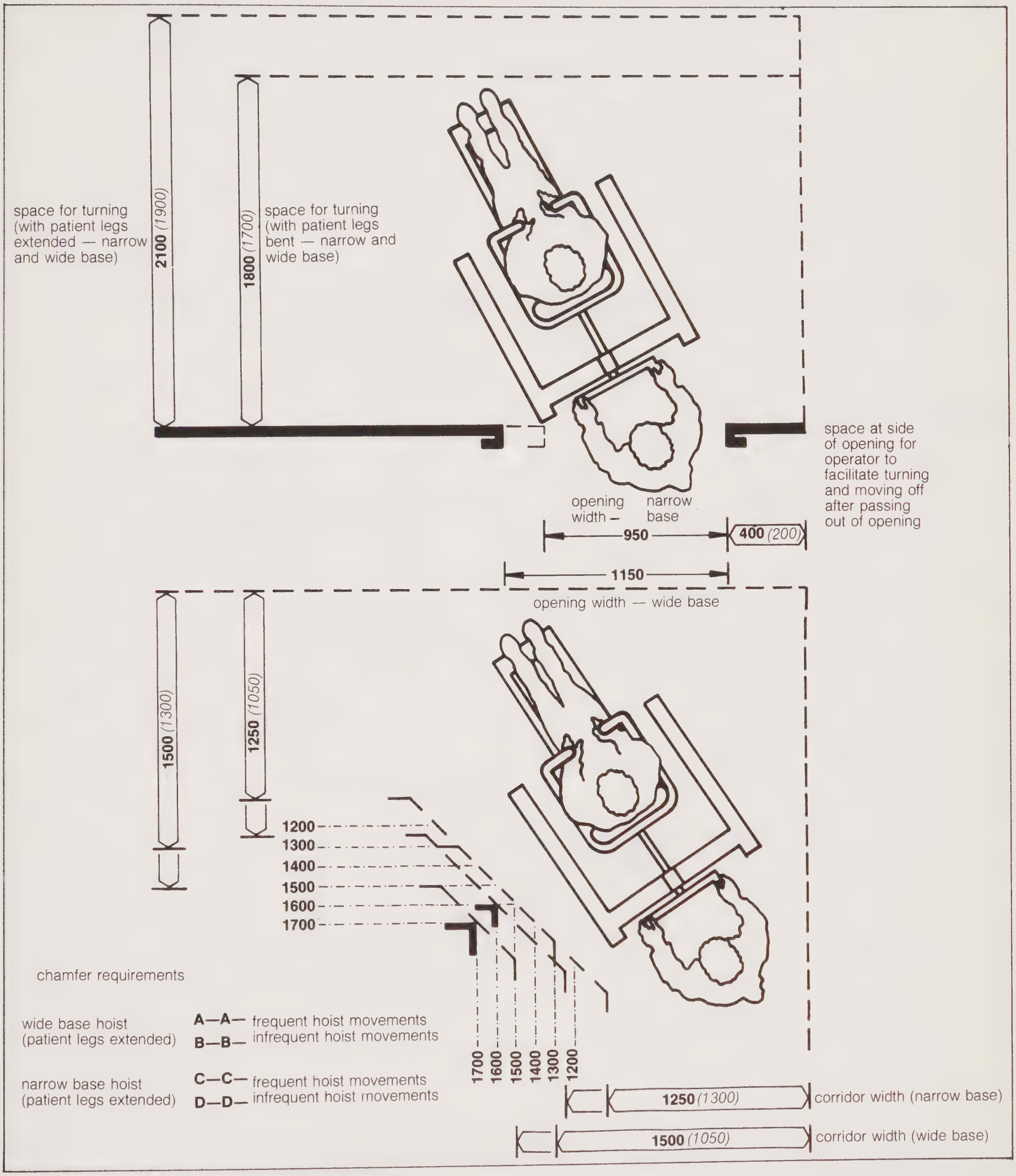
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Patient hoist

8A3

Mobile chair hoist
(wide or narrow base)

Users:
1 staff (moving hoist)



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Activities:
Turning hoist and patient through 90⁰ & 180⁰
Rotating hoist only

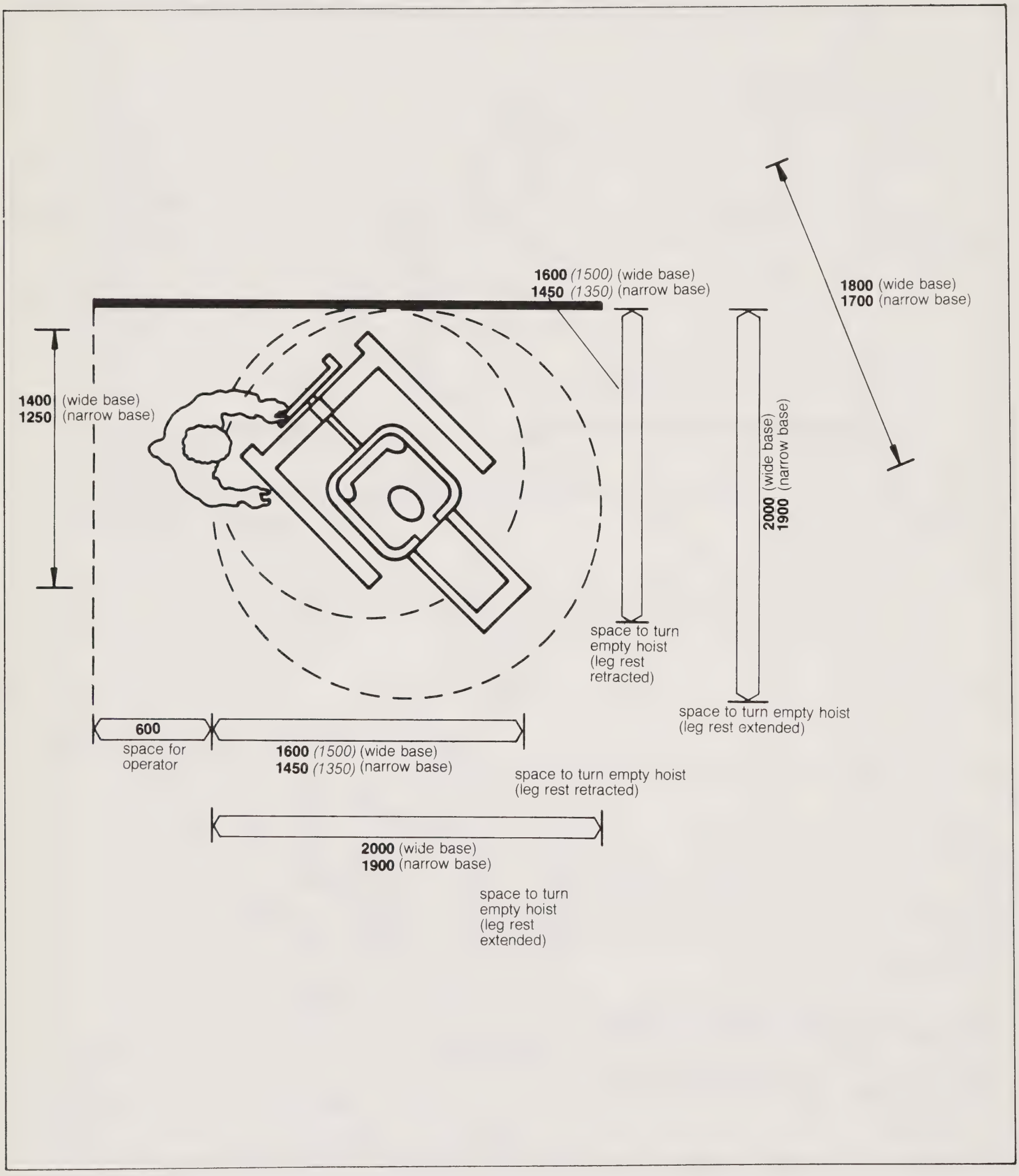
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Patient hoist

84A

Mobile chair hoist

Users:
1 staff (moving hoist)


1600 (1500) (wide base)
1450 (1350) (narrow base)
1800 (wide base)
1700 (narrow base)
1400 (wide base)
1250 (narrow base)
2000 (wide base)
1900 (narrow base)
space to turn empty hoist (leg rest retracted)
space to turn empty hoist (leg rest extended)
600
space for operator
1600 (1500) (wide base)
1450 (1350) (narrow base)
space to turn empty hoist (leg rest retracted)
2000 (wide base)
1900 (narrow base)
space to turn empty hoist (leg rest extended)

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

reduce space necessary for rotating empty hoist.

Notes:

1. Extended leg rest can be retracted to

Ambulant People

Notes

The data sheets show space requirements for people walking independently, with assistants and with walking aids. The space requirements for people walking may be a critical factor in determining corridor width where pedestrian traffic is particularly heavy, and especially in areas where people are frequently assisted and use walking aids. Space requirements are given for various types of walking aids; generally it will be necessary to allow for use of the most space-consuming types ie walking frames or shoulder crutches.

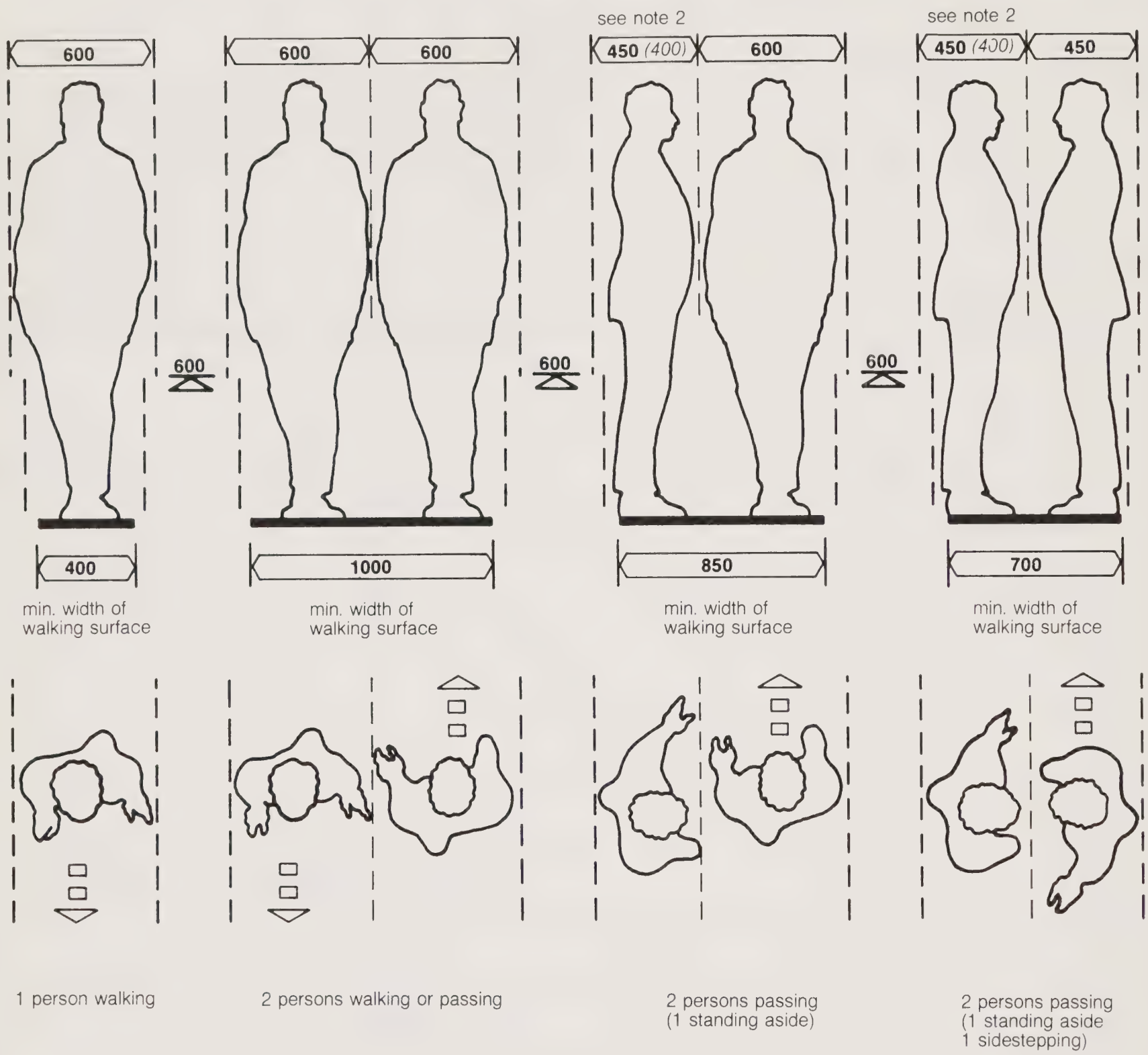
Activities:
Walking — circulating and passing.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Person

1A1

Users:
Fully capable adults.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Corridor widths: dimensions shown are for lanes of pedestrian traffic assuming travel distances of over 1500mm.
Lane dimensions are not necessarily minimum corridor widths. This applies particularly to 1 person walking and especially where the travel distance exceeds 2500mm where and additional allowance of at least 100mm should be provided to accommodate the normal oscillatory movements of persons walking.

2. Restricted passages: restricted side-stepping action is just possible at 450 but not 400. 6 or 7 side steps are a reasonable tolerance maximum — (2500mm maximum restricted passage length but beyond this the difficulty and inconveniencne becomes unacceptable even in very infrequently accessed situations. Ideally side stepping should be limited to 3 or 4 paces, ie a maximum restricted passage length of approx 1000mm.

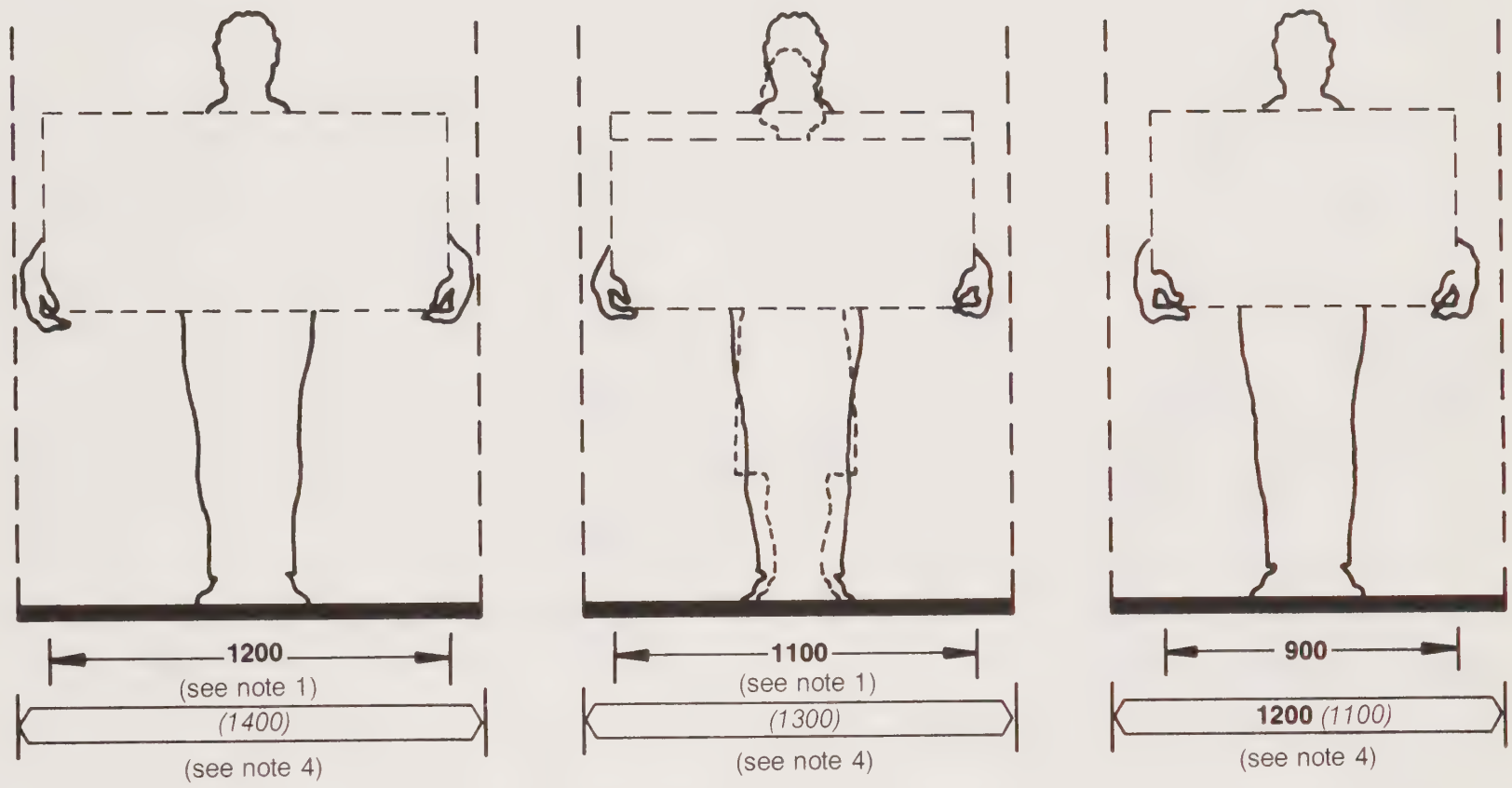
Activities:
Carrying medium to large sized objects

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Person

1A 7

Users:
Fully capable adults.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Maximum width of objects to be carried — where men only are involved — 1200 (criterion small man) — where men and women are involved — 1100 (criterion small woman).

2. These sizes assume that the weight and all other dimensional characteristics of the object carried are acceptable and allow it to be carried in an upright posture; that it is not necessary to bend the spine to lift the object; and that the peron's field of vision is not unduly obstructed by the object.

3. With heavy objects the reduction of object size below 450 will not significantly reduce the user space below 800 owing to the posture adopted.

4. The frequent manual handling of objects larger than 750 by women, and 900 by men, is not generally recommended. For objects greater than 900 wide, where frequent movements is unavoidable, the space requirements for circulation should be decided individually, depending on the characteristics of the task involved.

5. Bracketed (restricted) dimensions should only apply where movement is infrequent and/or of short duration.

Activities
Walking and passing through doors

DHSS **Ergonomic data bank**
Component-user data sheet not to scale

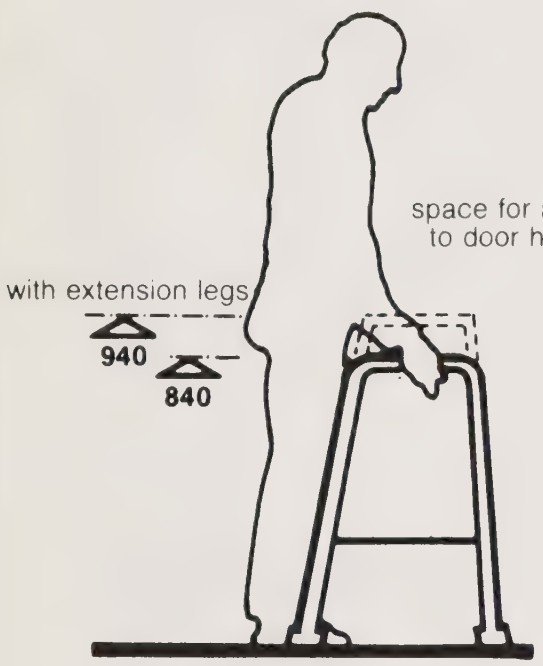
Person
1A2

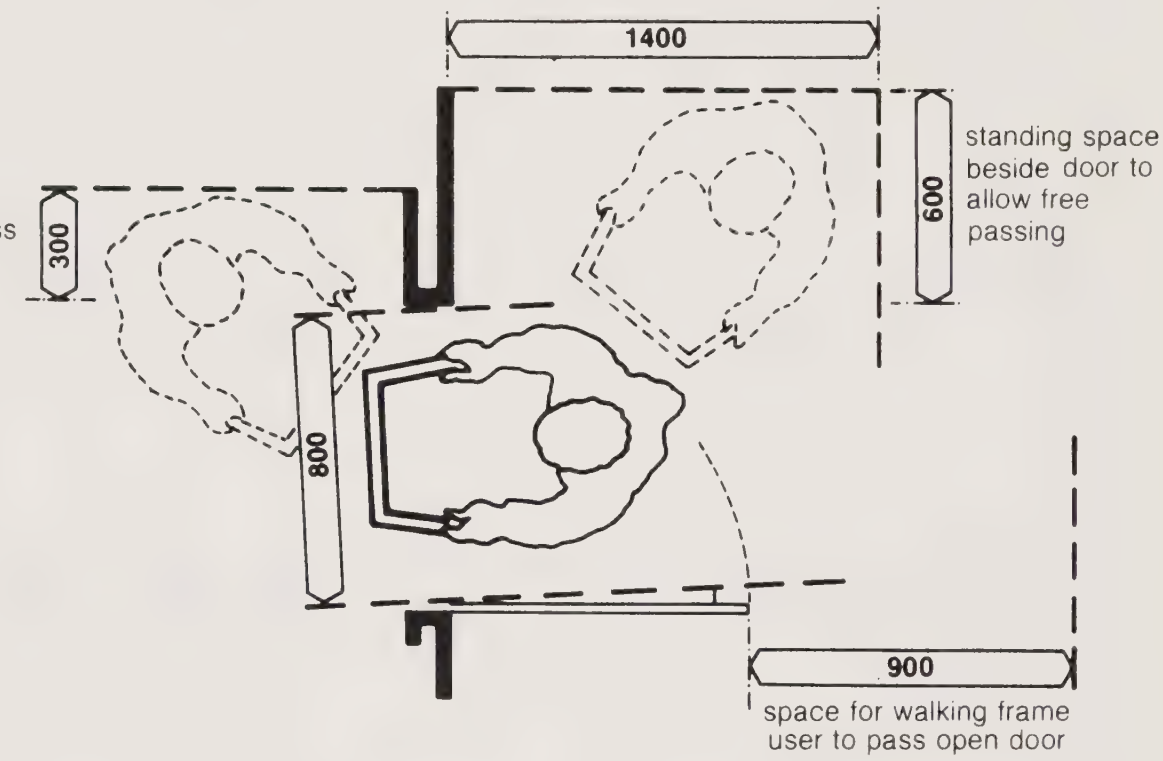
with walking frame
(lightweight)

Users
Partially capable (including the elderly)
independent or assisted

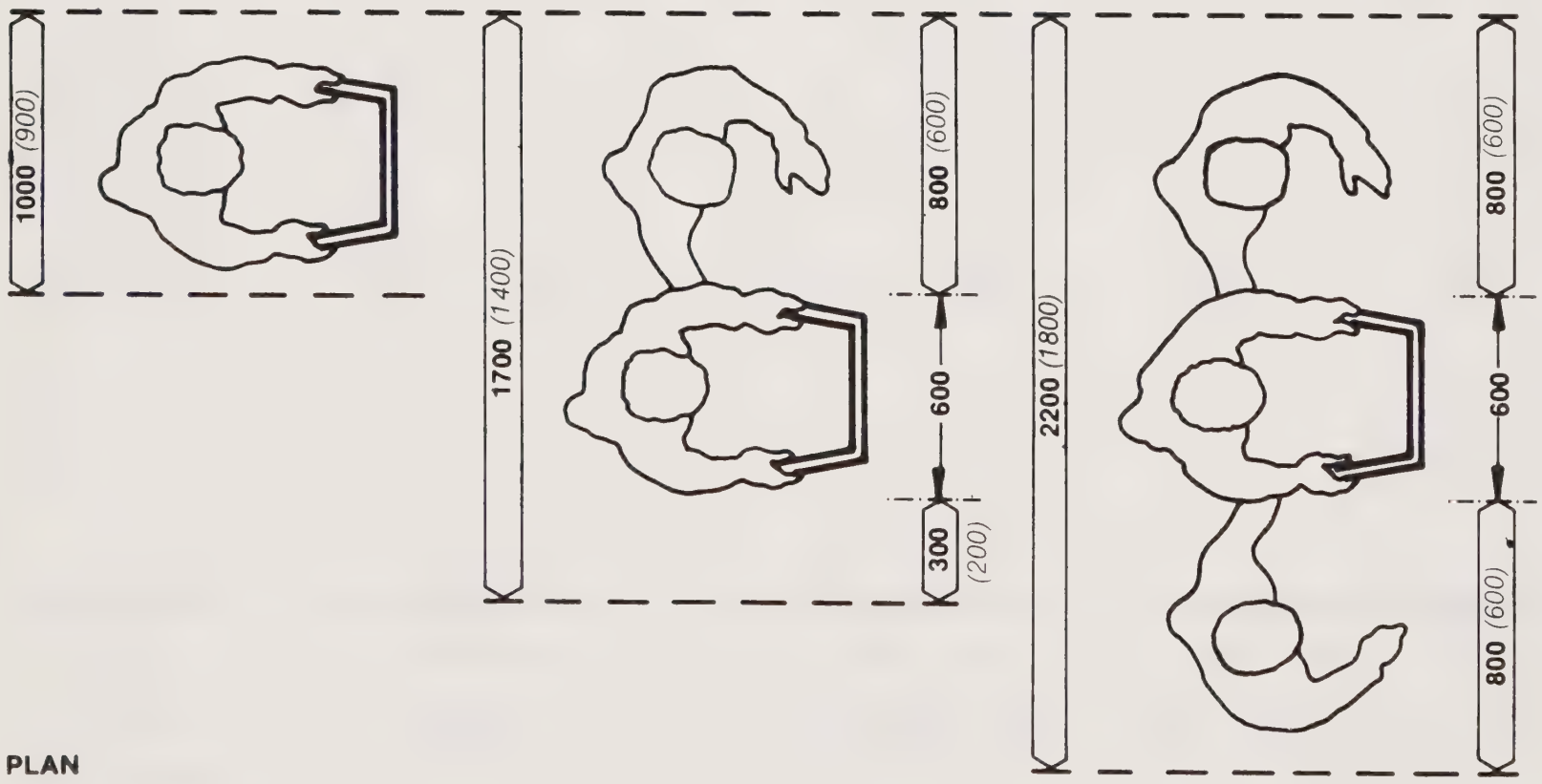
NORMAL CIRCULATION

SPACE FOR INDEPENDENT USER TO
PASS THROUGH SINGLE LEAF DOOR





ELEVATION



PLAN

1350 *(1300)*

Preferred minimum

Restricted minimum (not recommended for general use: see explanatory notes)

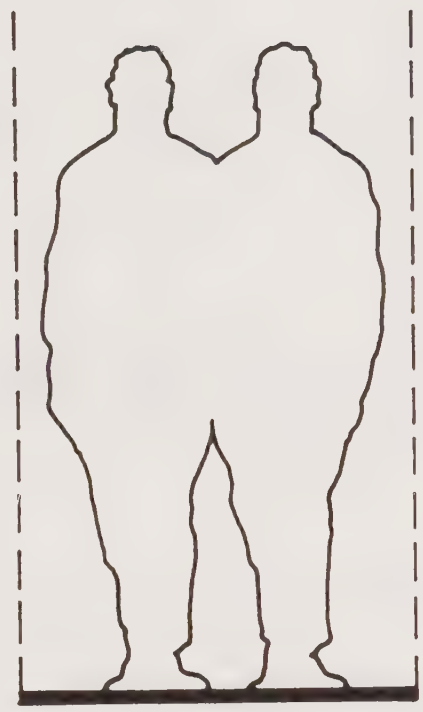
Activities:
Walking with assistance

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Person

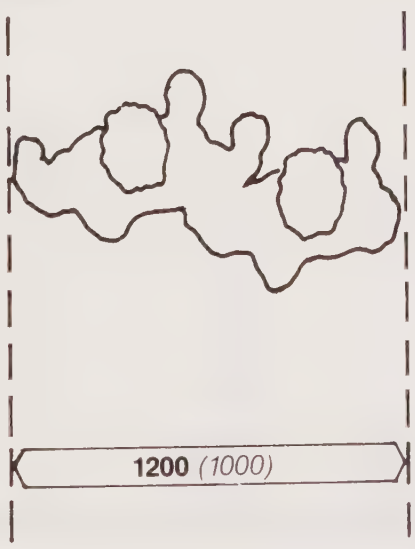
1A3

Users:
Partially capable with assistance

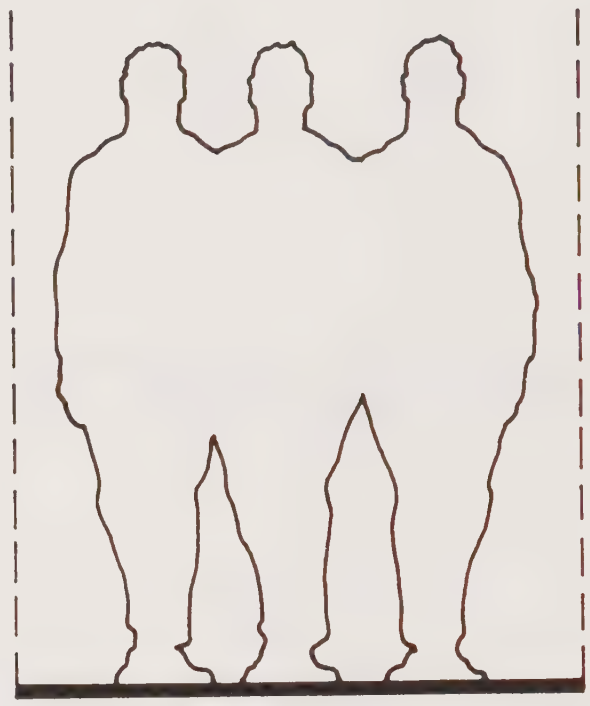


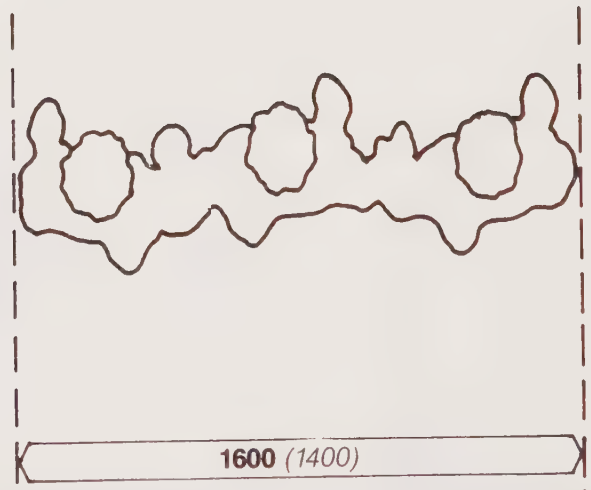
ELEVATION

PLAN



WALKING ASSISTED BY ONE PERSON





(1500) — where assisted patient is very debilitated

see notes 1 and 2

WALKING ASSISTED BY TWO PERSONS

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1 Dimensions — unbracketed dimensions are preferred minima for widths of lanes of pedestrian traffic assuming a total travel distance of more than 1500 mm.
— bracketed dimensions are restricted minima applicable to movement through door openings or similar where the travel distance does not exceed 1500 (the bracketed dimensions should not be used for normal pedestrian traffic lane requirements).
2. Corridor widths
— the dimensions shown are lane dimensions and not minimum corridor widths. Where either walking with one or two assistants is the only critical criterion in determining a corridor width, and where the travel distance exceeds 2500, it is recommended that an additional allowance of at least 100mm be provided to accommodate the normal oscillatory movements of persons walking.

Activities:
Walking with the aid of one or two sticks and one or two assistants.
Walking with the aid of one or two tripods and one or two assistants

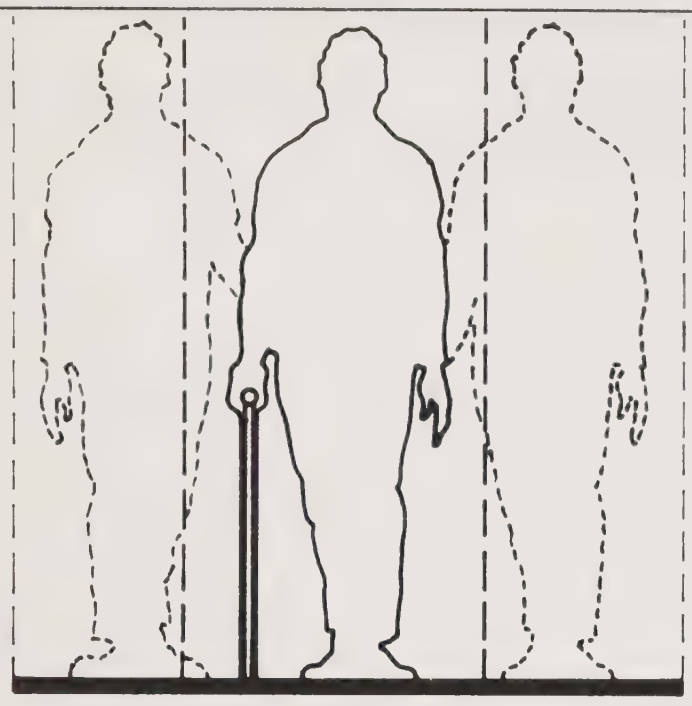
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Person

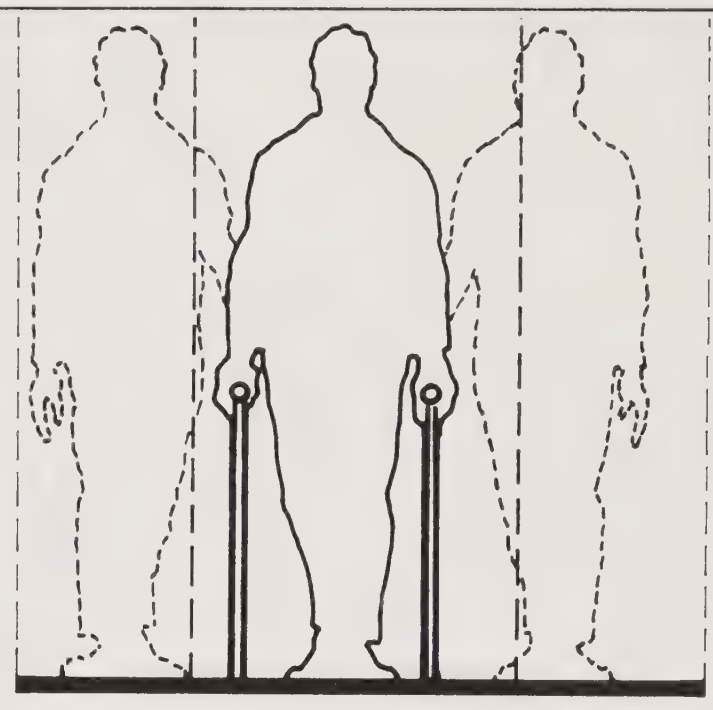
1A4

With walking sticks or tripods

Users:
Partially capable, independent or assisted



800 *(750)*
one stick (see note 3)



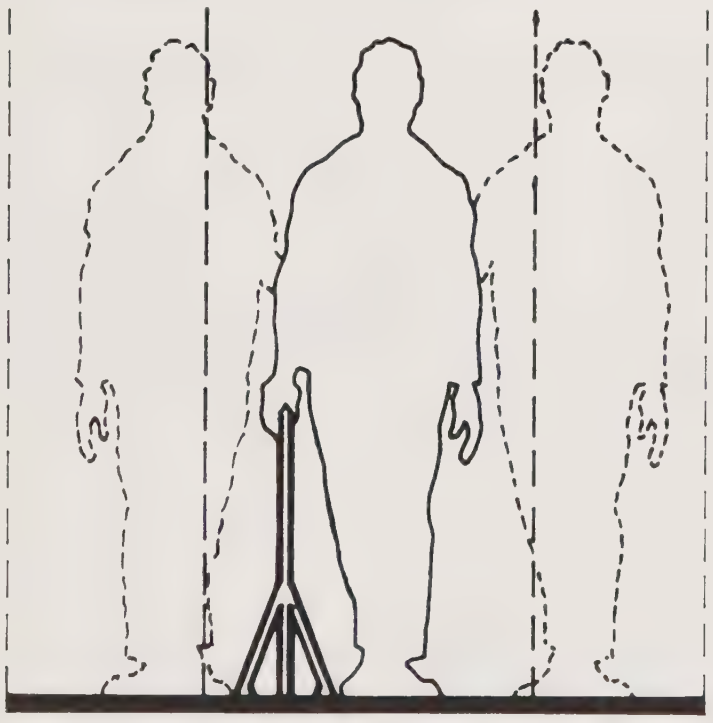
900 *(800)*
two sticks (see note 3)

1350 *(1300)*
one stick and one assistant (see note 1)

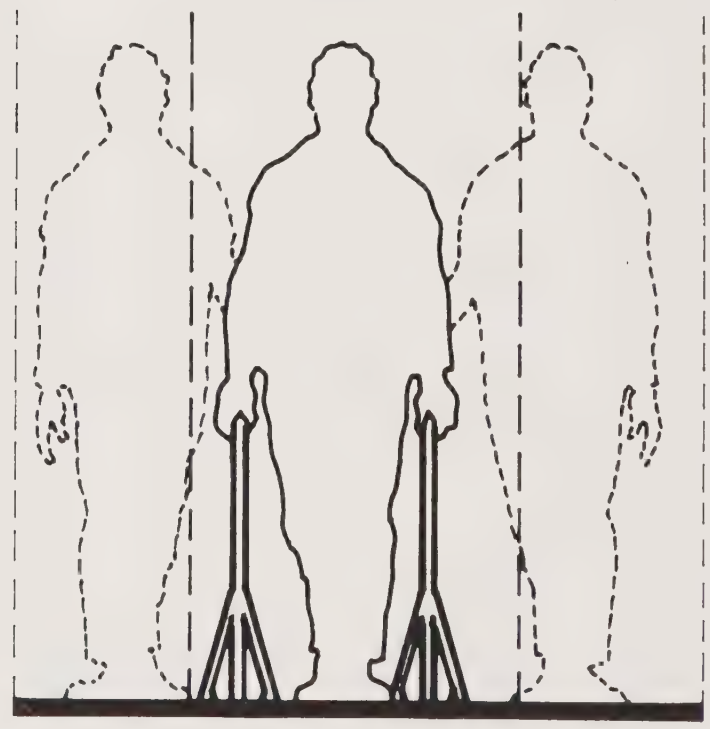
1400 *(1350)*
two sticks and one assistant (see note 1)

1850 *(1750)*
one stick and two assistants (see note 1)

1900 *(1800)*
two sticks and two assistants (see note 1)



900 *(850)*
one tripod (see note 3)



950
two tripods

1400 *(1350)*
one tripod and one assistant (see note 1)

1450 *(1400)*
two tripods and one assistant (see note 1)

1900 *(1850)*
one tripod and two assistants (see note 1)

1950 *(1850)*
two tripods and two assistants (see note 1)

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

Bracketed dimensions (assisted users).

1. Space for assisting is slightly restricted and therefore not recommended in heavily used areas.

2. Patients can be assisted from behind and/or in front when passing through an opening.

3. Independent circulation — bracketed dimension is satisfactory for short travel distances only.

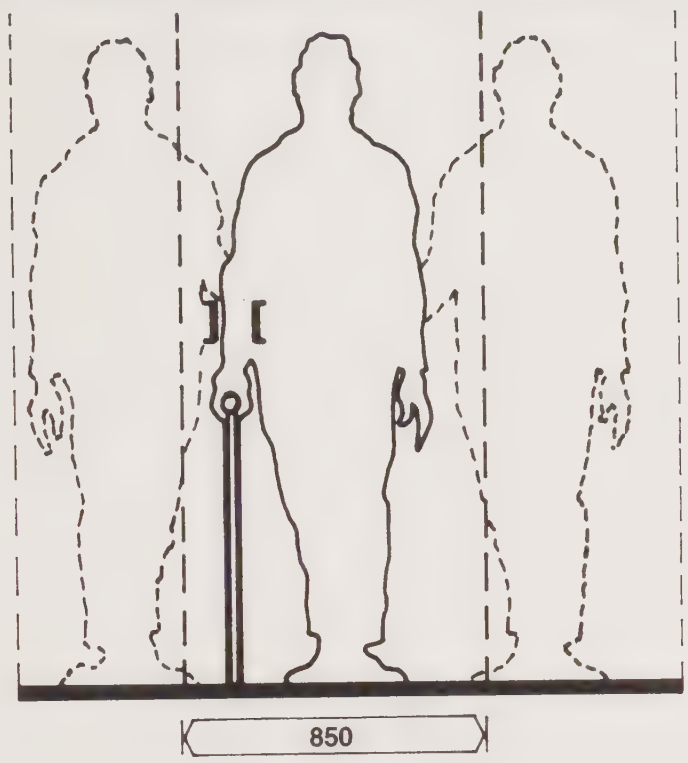
Activities:
Walking with aid of elbow or shoulder crutches and one or two assistants

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Person

1A5

Users:
Partially capable, independent or assisted



850

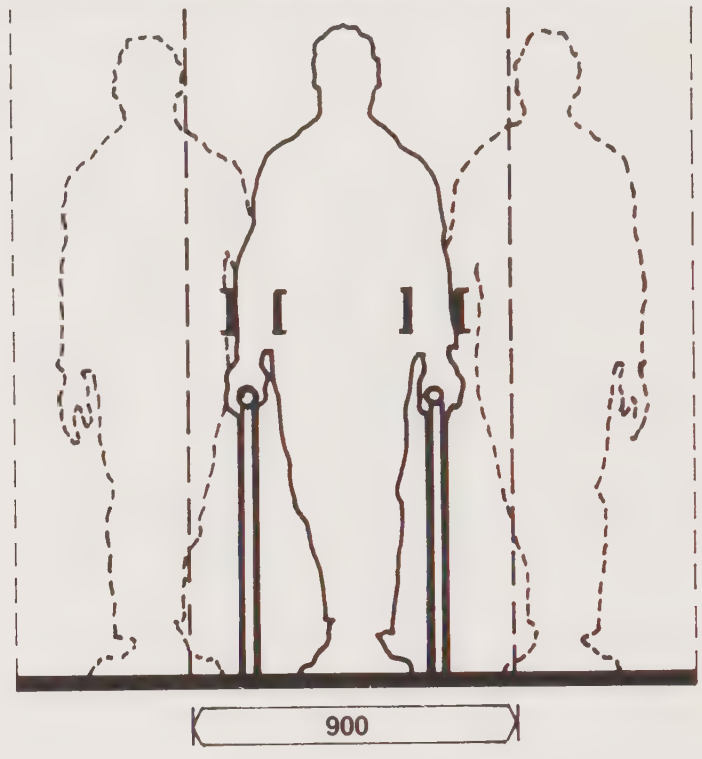
one elbow crutch

1400 *(1350)*

one elbow crutch and one assistant (see note 1)

1850 *(1750)*

one elbow crutch and two assistants (see note 1)



900

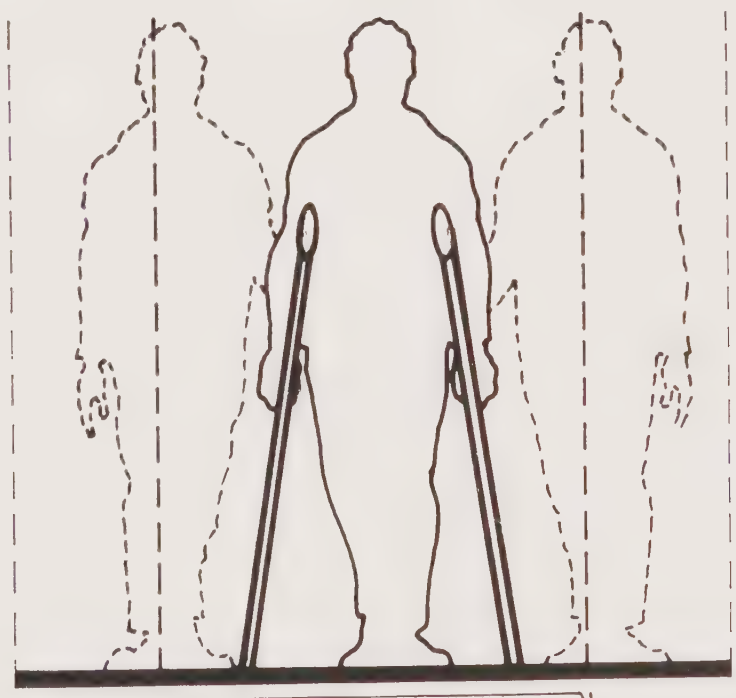
two elbow crutches

1400 *(1350)*

two elbow crutches and one assistant (see note 1)

1900 *(1800)*

two elbow crutches and two assistants (see note 1)



1200 *(1000)*

two shoulder crutches

two shoulder crutches and one assistant (see note 1)

1600 *(1500)*

two shoulder crutches and two assistants (see note 1)

2000 *(1800)*

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

Bracketed dimensions (assisted users).

1. Space for assisting is slightly restricted and therefore not recommended in heavily used areas.

2. Patients can be assisted from behind and/or in front when passing through an opening.

Wheelchairs

Notes

The data sheets relate to standard 8L wheelchairs which is one of the largest types most likely to be used. (Where larger specialised wheelchairs are used additional space may be required.) The skill of the wheelchair user is an important factor in determining space requirements, therefore the dimensions given take into account the need to allow for the high proportion of inexperienced wheelchair users likely to use health buildings. Reference should also be made to Volume I of Common Activity Spaces for further information on Wheelchairs. (See page 24 for wheelchair passing examples.)

Activities:
Straight movement of wheelchair

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

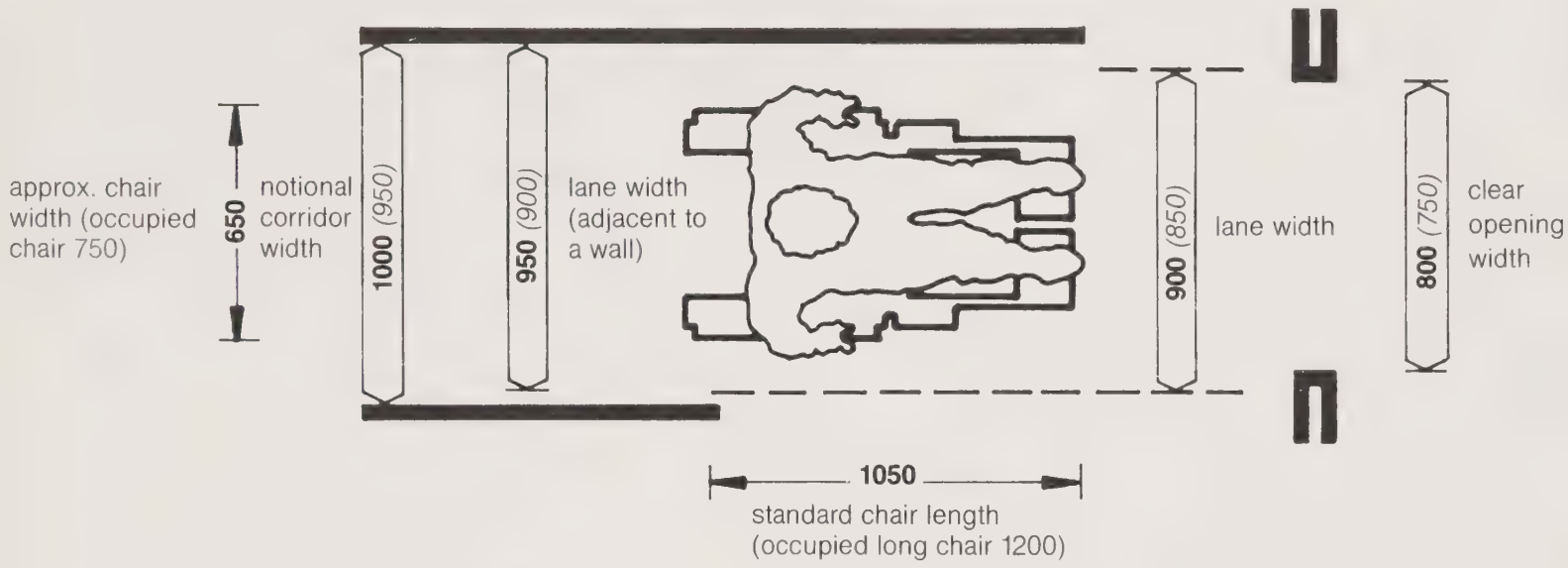
Wheelchair

1C3

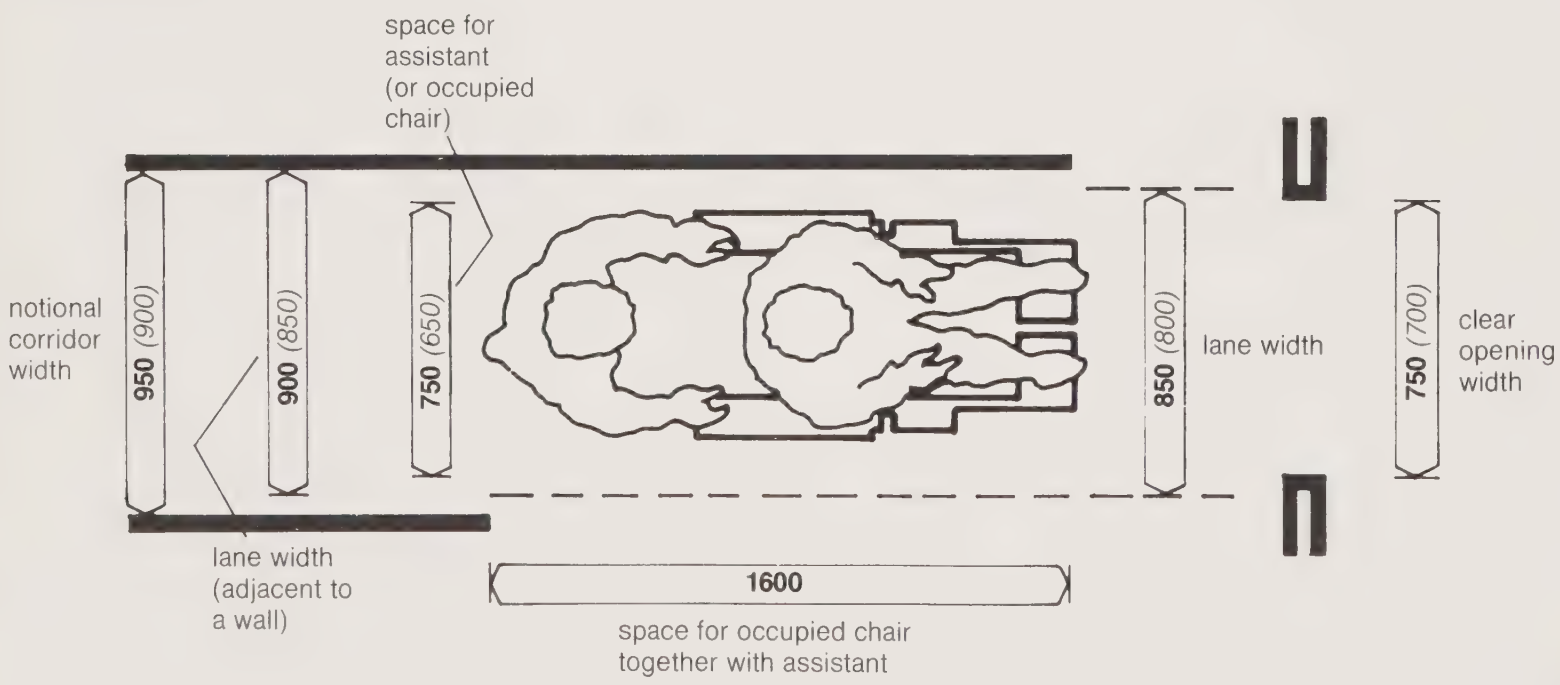
Standard DHSS (8L)
see note 1

Users:
Assisted and independent users

INDEPENDENT WHEELCHAIR USERS



ASSISTED WHEELCHAIR USERS



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

most types of wheelchair. However, wheelchairs with elevated legrests, extended footrests, headrests, reclining backs etc. may result in larger components and consequent space requirements.

Notes

1. Component envelope shown will also accept

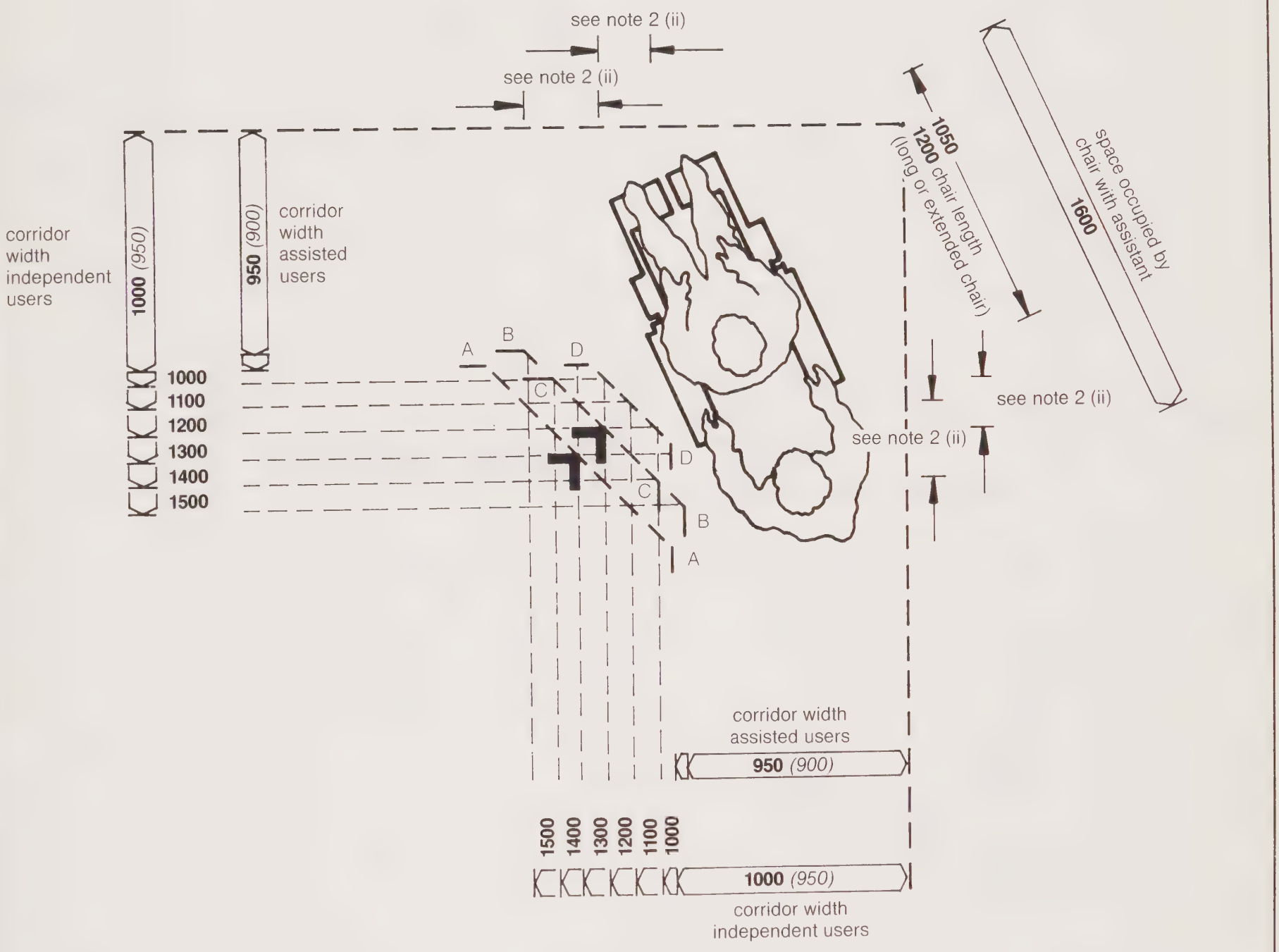
Activities:
Turning around a 90° bend

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Wheelchair
1C4

Standard DHSS (8L)

Users:
Independent and assisted



Chamfer requirements

Assisted users
A-A-frequent or important movement
B-B infrequent movement

Independent users
C-C-frequent or important movements
D-D-infrequent movement

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Component envelope shown will also accept most types of wheelchair. However wheelchairs with elevated legrests, extended footrests, headrests, reclining backs etc. may result in larger components and consequent space requirements

2. Dimensions of chamfers — examples:
i) Both corridors 1300 wide — no chamfer required for any category of wheelchair movement.
ii) Both corridors 1000 wide — with infrequent independent wheelchair movements — 200 x 200 chamfer required.
iii) 1100 corridor meeting 1200 corridor with frequent assisted wheelchair movement — 300 x 300 chamfer required.

Activities:
Movement of wheelchairs — turning through 90° & 180°

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

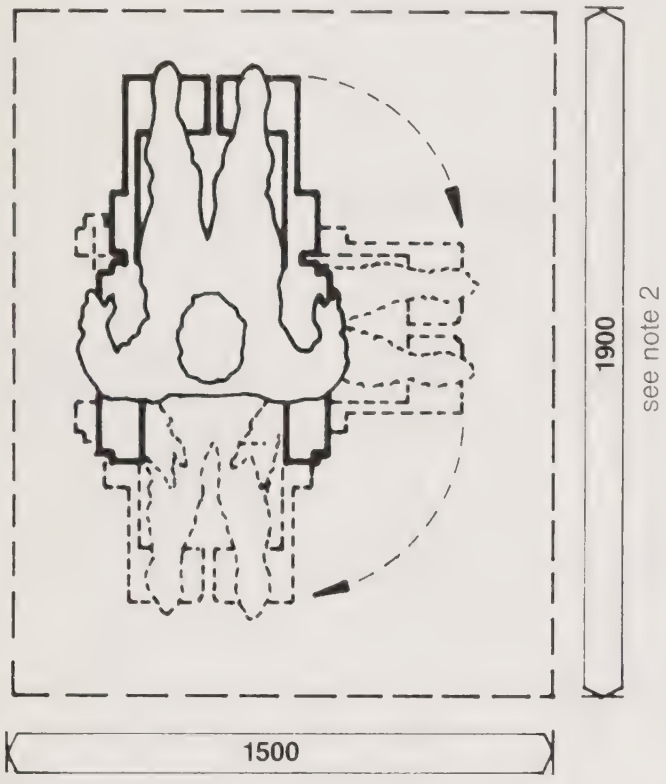
Wheelchair

1C5

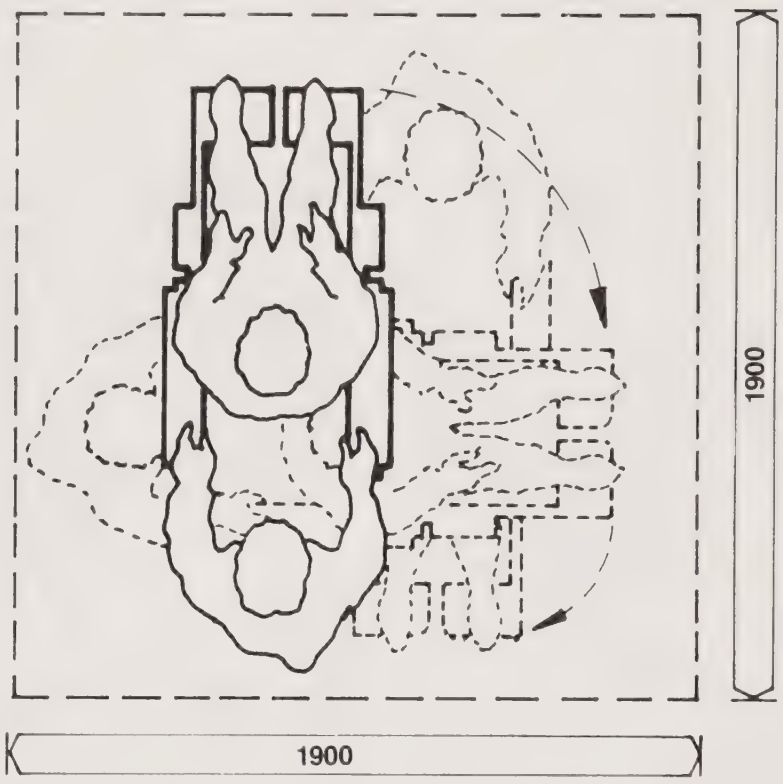
Standard DHSS (8L & 8G) see note 1

Users:
Assisted and independent users

INDEPENDENT WHEELCHAIR USERS TURNING THROUGH 180°

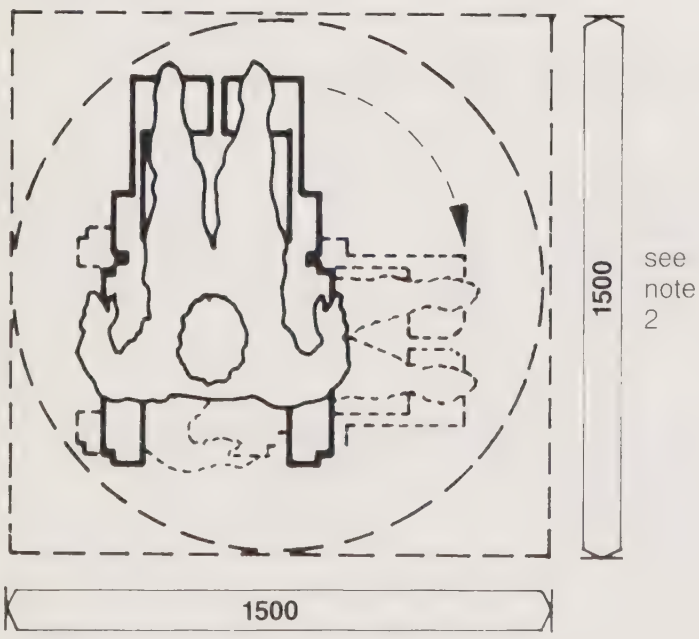


ASSISTED WHEELCHAIR USERS TURNING THROUGH 90° & 180° (& 360°)



(for extended foot rest position add 100)
(for elevated leg rest position add 350)

INDEPENDENT WHEELCHAIR USERS TURNING THROUGH 90°



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Component envelope will also accept most types of wheelchair. However wheelchairs with elevated legrests, extended footrests, headrests, reclining backs etc. may result in a larger component space.

2. The 1900 x 1500 space is a recommended minimum for general circulation areas. In other areas, a clear space of 1500 diameter, as part of a larger space which also contributes to the space available for wheelchair manoeuvring is generally satisfactory.

NB. A skilled wheelchair user can achieve 180° and 360° turn in a space of 1500 x 1500 but this is extremely difficult and therefore not possible for inexperienced and/or debilitated users.

Activities
Passing through 900 door sets
(A) Frontal Approach

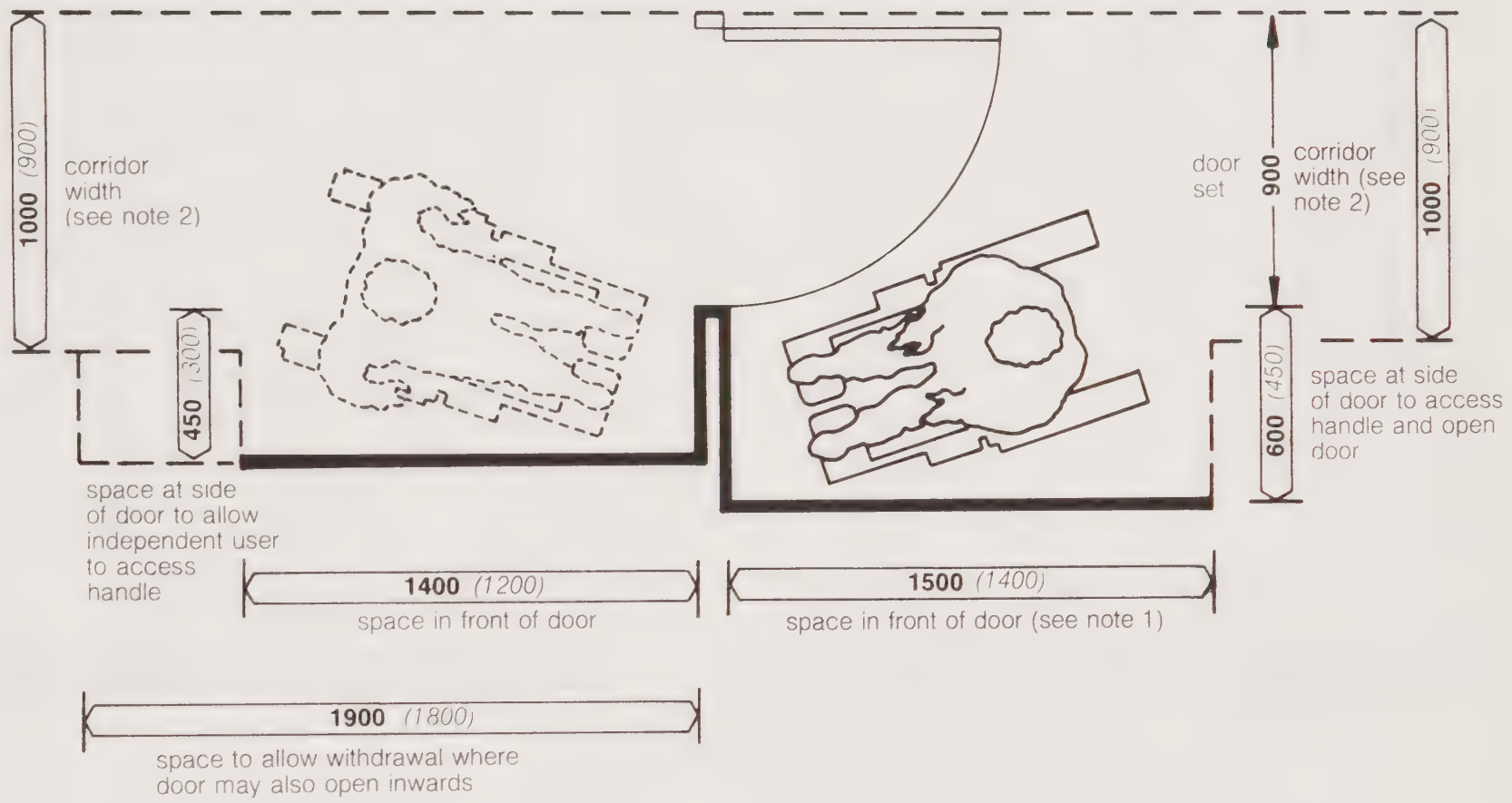
DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Wheelchair

1C6

Standard DHSS (8L)

Users
Assisted and independent


1000 (900)
corridor width (see note 2)
450 (300)
space at side of door to allow independent user to access handle
door set
900
corridor width (see note 2)
1000 (900)
600 (450)
space at side of door to access handle and open door
1400 (1200)
space in front of door
1500 (1400)
space in front of door (see note 1)
1900 (1800)
space to allow withdrawal where door may also open inwards

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. 1500 space in front of door is essential when only restricted space (450) is available at side of door

2. Passageways used frequently by wheel chair traffic should be at 1400 (1200) wide. (NB This does not allow two wheelchairs to pass see WHEELCHAIR straight movement data sheets)

Activities
Passing through 900 door sets
B Lateral approach

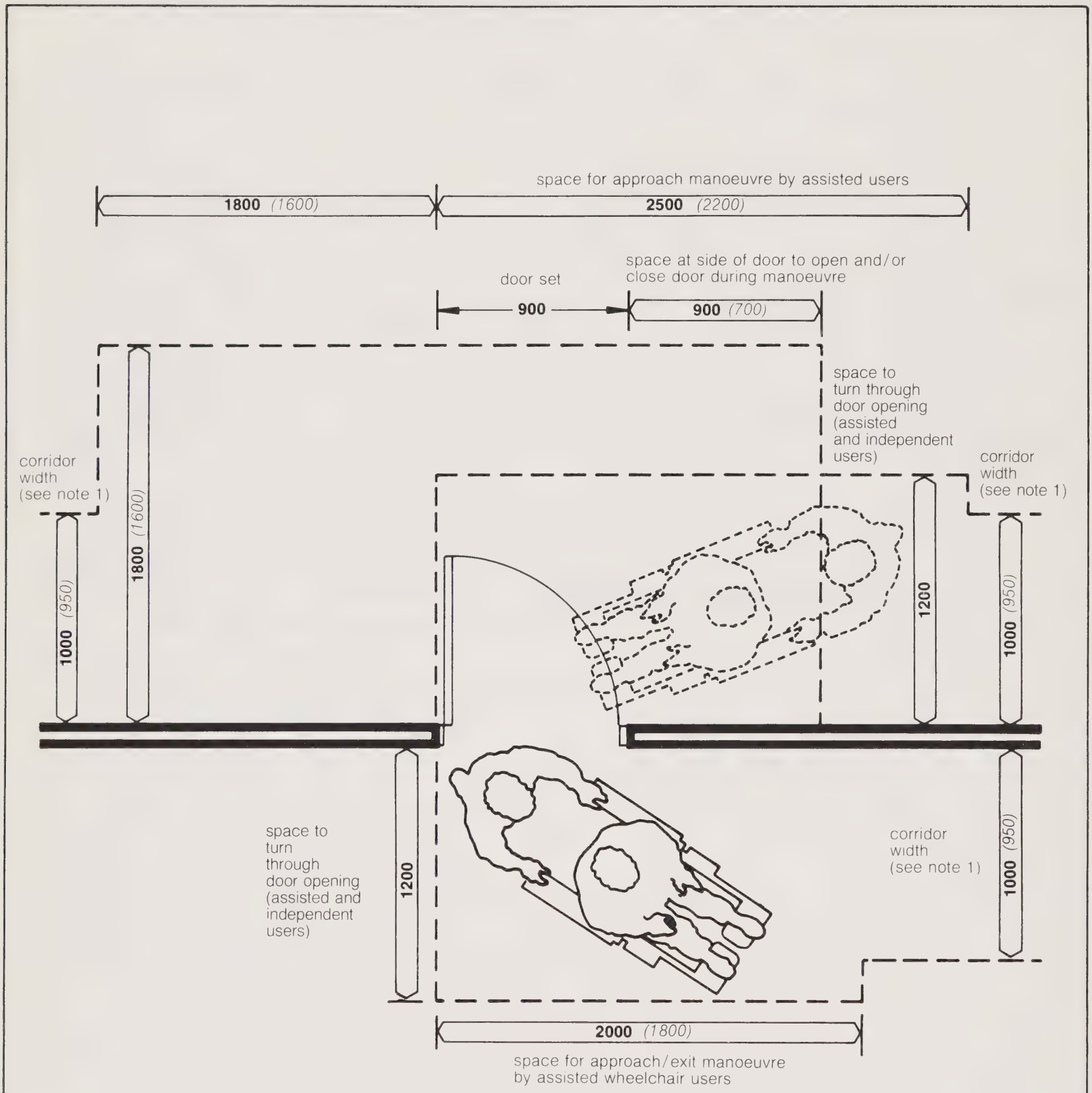
DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Wheelchair

1C7

Standard DHSS (8L)

Users
Assisted and independent


space for approach manoeuvre by assisted users
1800 (1600)
2500 (2200)
door set
space at side of door to open and/or close door during manoeuvre
900
900 (700)
space to turn through door opening (assisted and independent users)
corridor width (see note 1)
corridor width (see note 1)
1000 (950)
1800 (1600)
1200
1000 (950)
space to turn through door opening (assisted and independent users)
1200
corridor width (see note 1)
1000 (950)
2000 (1800)
space for approach/exit manoeuvre by assisted wheelchair users

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

chair traffic should be at least 1400 (1200) wide. (NB. This does not allow two wheelchairs to pass, see WHEELCHAIR straight movement data sheets)

Notes

1. Passageways used frequently by wheel-

Activities:
Parking and storage of wheelchairs, end to end. See also WHEELCHAIR, parking/storage, side by side.

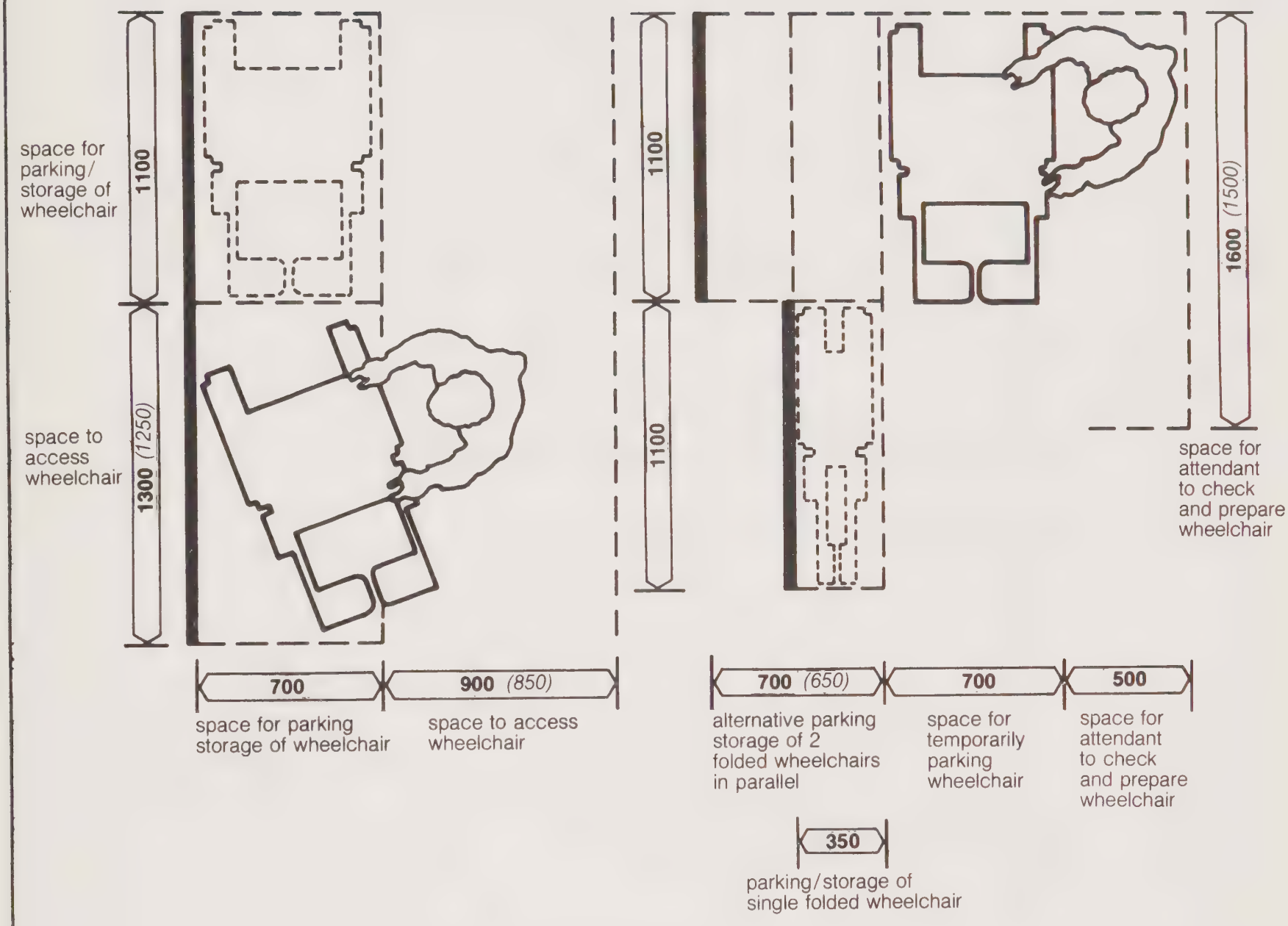
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Wheelchair

1C13

Standard DHSS (8L)

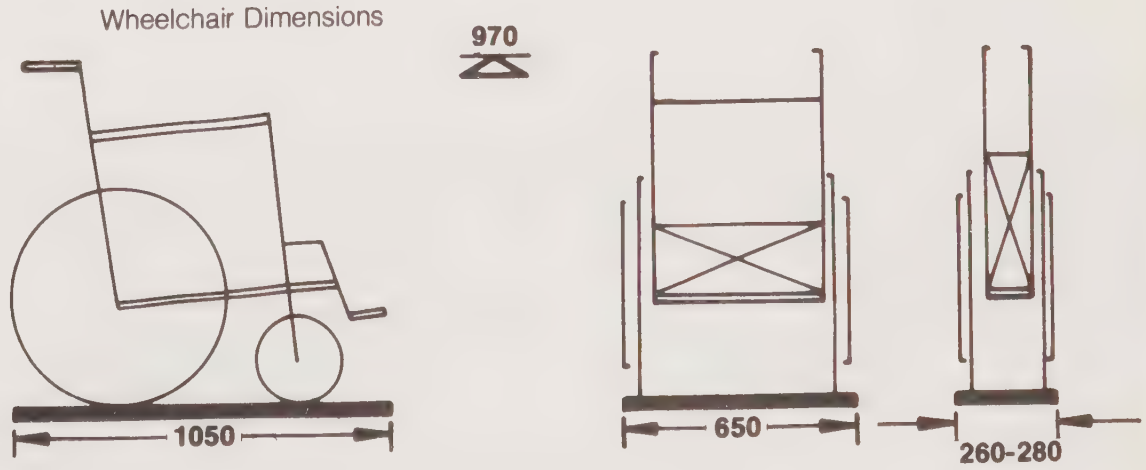
Users:
staff



1350 *(1300)*

Preferred minimum: Restricted minimum (not recommended for general use: see explanatory notes)

Wheelchair Dimensions



Activities:
Parking and storage of wheelchairs, side by side. See also WHEELCHAIR, parking/ storage end to end

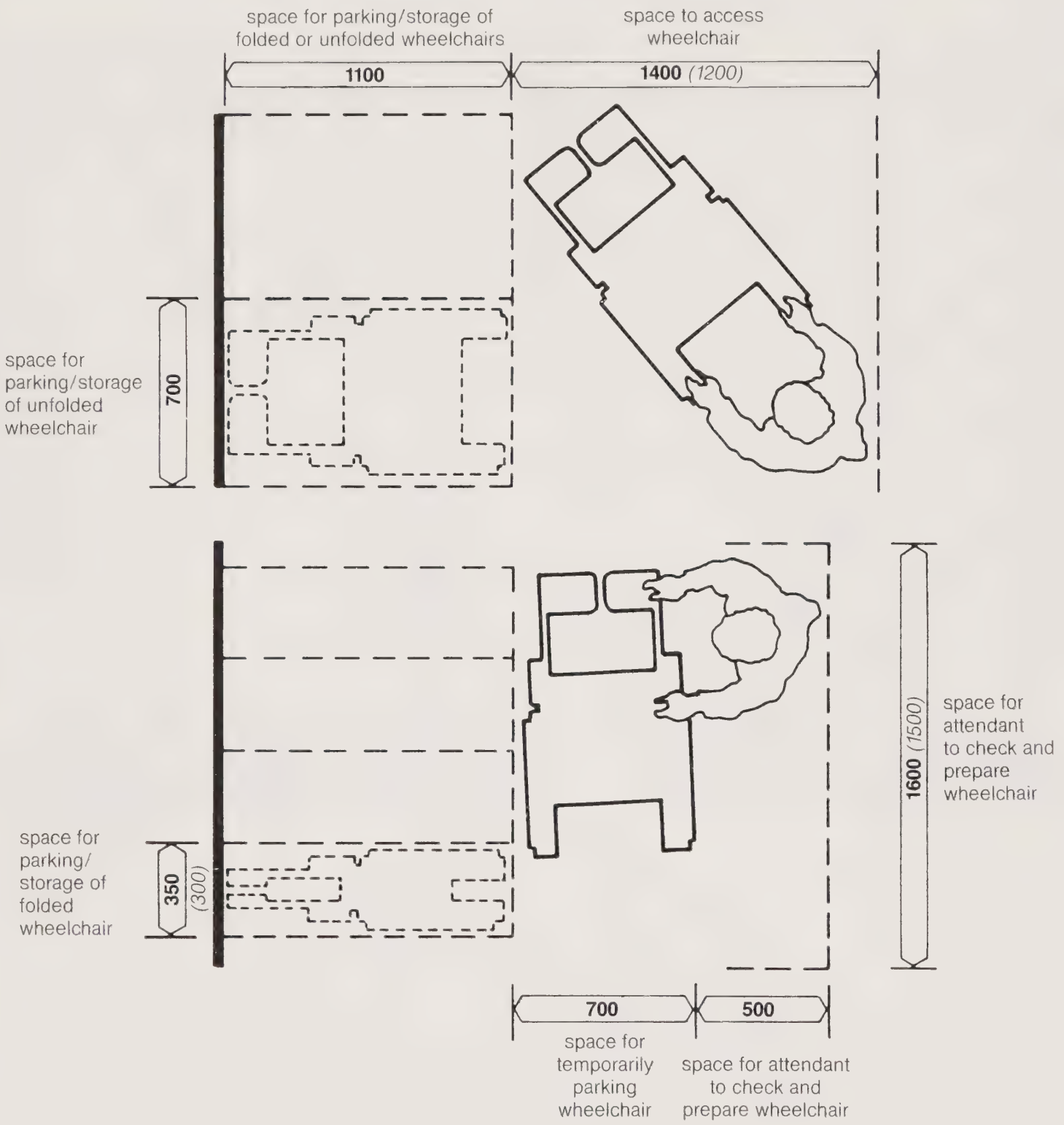
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Wheelchair

1C14

Standard DHSS (8L)

Users:
Staff


space for parking/storage of folded or unfolded wheelchairs
1100
space to access wheelchair
1400 (1200)
space for parking/storage of unfolded wheelchair
700
space for parking/ storage of folded wheelchair
350 (300)
1600 (1500)
space for attendant to check and prepare wheelchair
700
500
space for temporarily parking wheelchair
space for attendant to check and prepare wheelchair

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Activities:
Passing through entrance lobbies with double leaf doors.

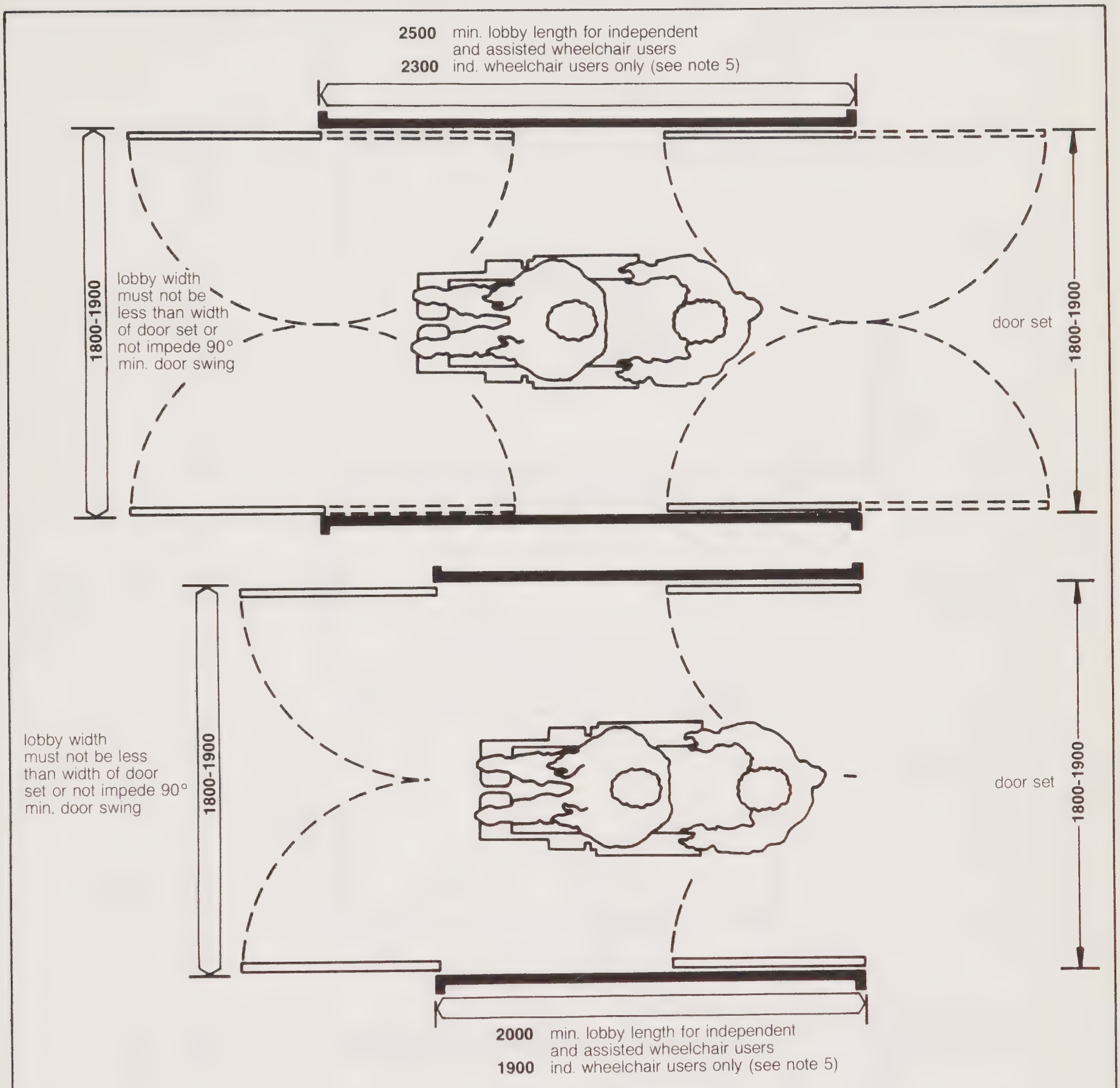
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Wheelchair

1C11

Standard DHSS (8L)

Users:
Independent and assisted users


2500 min. lobby length for independent and assisted wheelchair users
2300 ind. wheelchair users only (see note 5)
1800-1900
lobby width must not be less than width of door set or not impede 90° min. door swing
door set
1800-1900
lobby width must not be less than width of door set or not impede 90° min. door swing
1800-1900
door set
1800-1900
2000 min. lobby length for independent and assisted wheelchair users
1900 ind. wheelchair users only (see note 5)

1350 *(1300)*

Preferred minimum: Restricted minimum (not recommended for general use: see explanatory notes)

Notes:

1. See also BS5810 (1979)

2. Lobby lengths slightly larger than the minimum shown here will facilitate safer and generally easier use in high traffic areas (400 - 500 increase in the case of the two smaller lobbies).

3. Dimensions are between door faces of double doors.

4. Automatic doors - minimum lobby lengths for double doors should be
a) for side hung doors 2500mm.
b) for sliding doors 2100 mm.

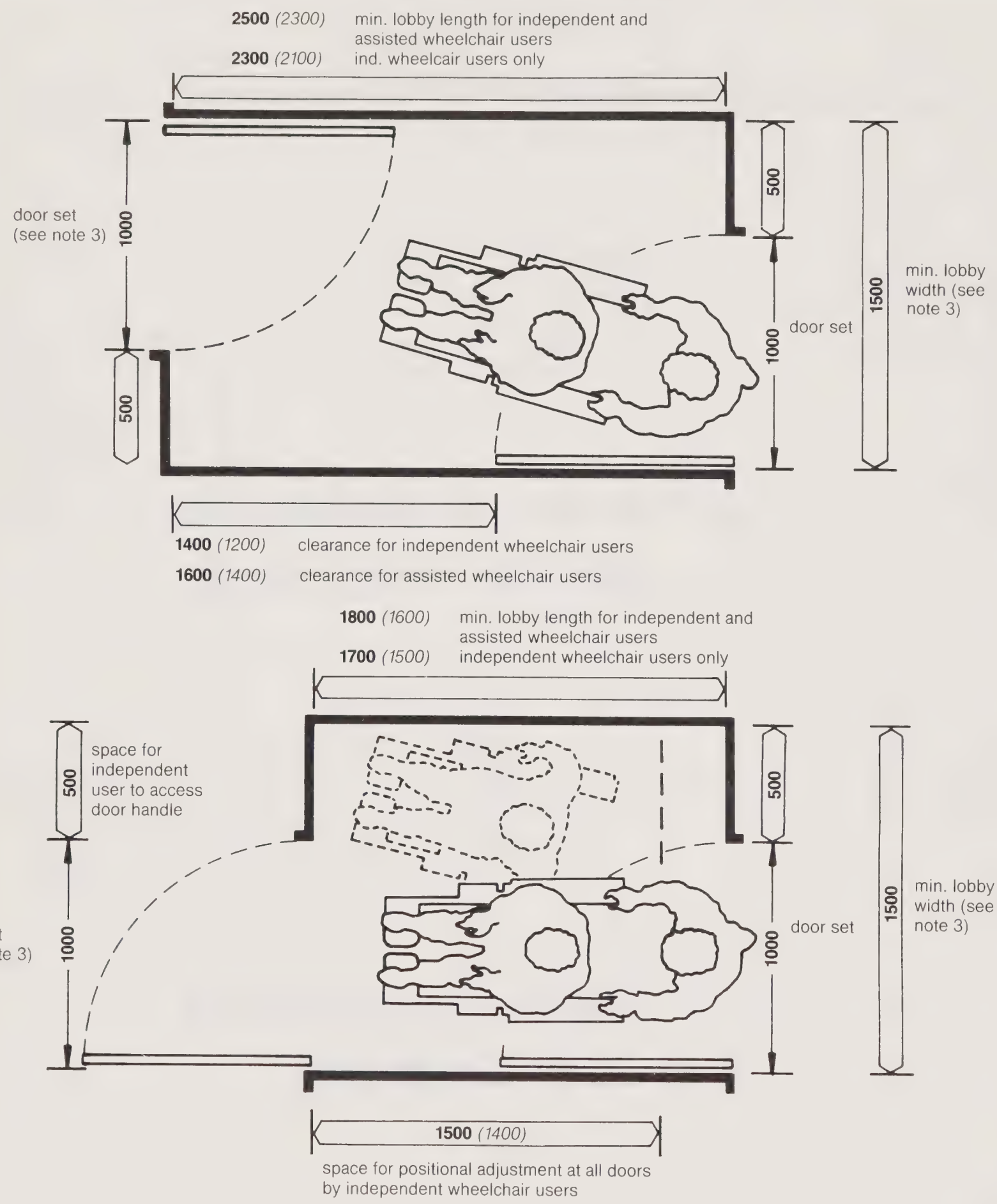
5. Restricted conditions are unacceptable because of the difficulty presented by manoeuvring through double doors.

Activities:
Independent and assisted wheelchair users passing through entrance lobbies with single leaf doors

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Wheelchair
1C10
Standard DHSS (8L)

Users:
Independent and assisted wheelchair users


2500 (2300) min. lobby length for independent and assisted wheelchair users
2300 (2100) ind. wheelcair users only
door set (see note 3)
1000
500
500
1000
door set
1500
min. lobby width (see note 3)
1400 (1200) clearance for independent wheelchair users
1600 (1400) clearance for assisted wheelchair users
1800 (1600) min. lobby length for independent and assisted wheelchair users
1700 (1500) independent wheelchair users only
500
space for independent user to access door handle
door set (see note 3)
1000
500
1000
door set
1500
min. lobby width (see note 3)
1500 (1400)
space for positional adjustment at all doors by independent wheelchair users

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. See also BS5810 (1979)

2. Lobby lengths slightly larger than the minimum shown here will facilitate safer and generally easier use in high traffic areas (400-500 in the case of the two smaller lobbies).

3. Single leaf doors — 600 space to side of door is preferred where it is necessary to close door when passing in opposite directions resulting in an increase in lobby from 1500 to 1600. Use of 900 door sets is also possible but results in more restricted access — lobby width becomes 1400 (with 500 at side of door) and 1500 (with 600 at side of door).

Activities:
Passing through automatic doors (sliding)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

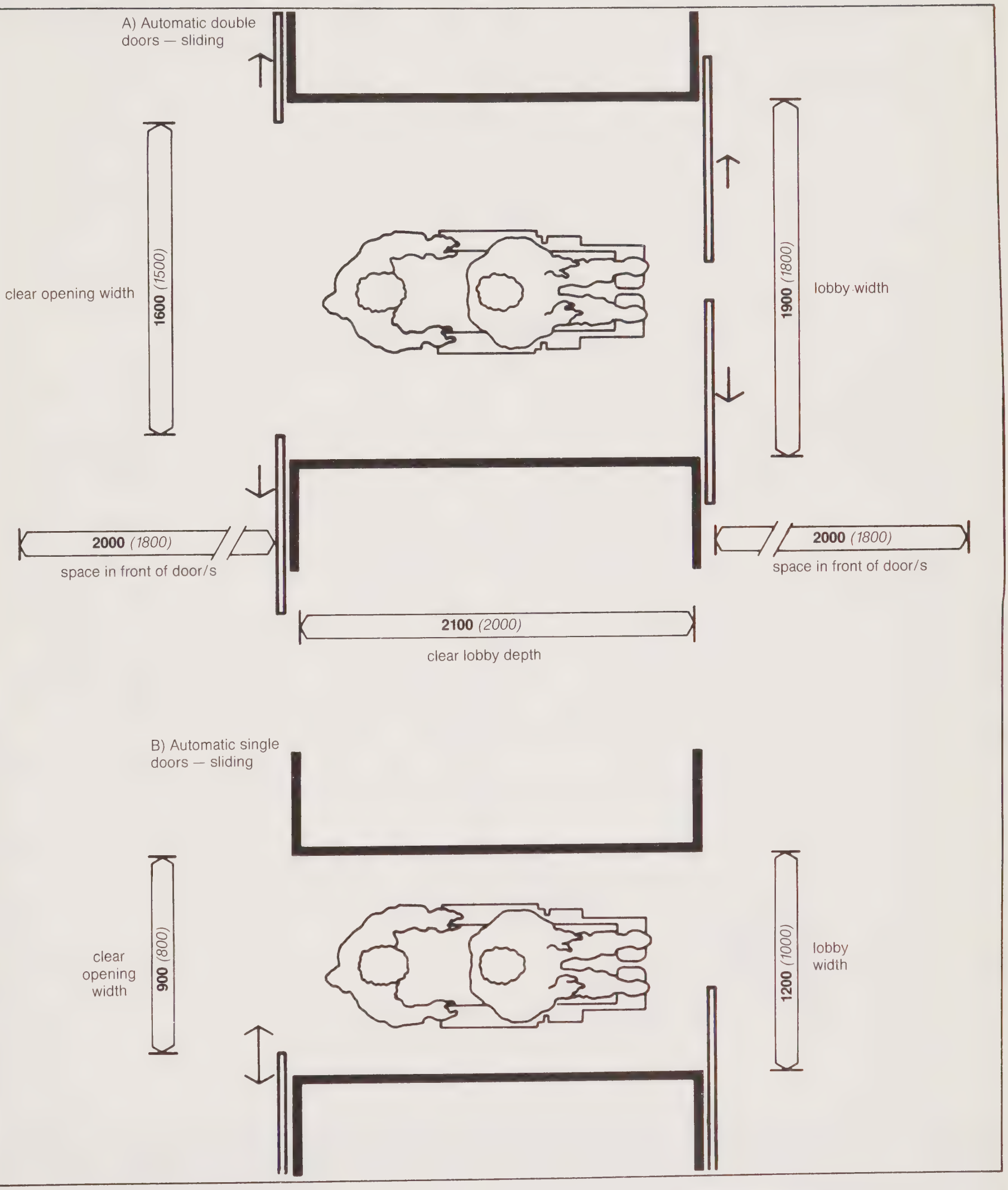
1C12

Wheelchair

Standard DHSS 8L

Users:
Assisted and independent users

A) Automatic double doors — sliding



B) Automatic single doors — sliding

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Double door lobbies are generally preferred in busy public areas.

2. Sensory units should be positioned at least 800 forward of leading side of door.

Activities:
Passing through sliding door

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

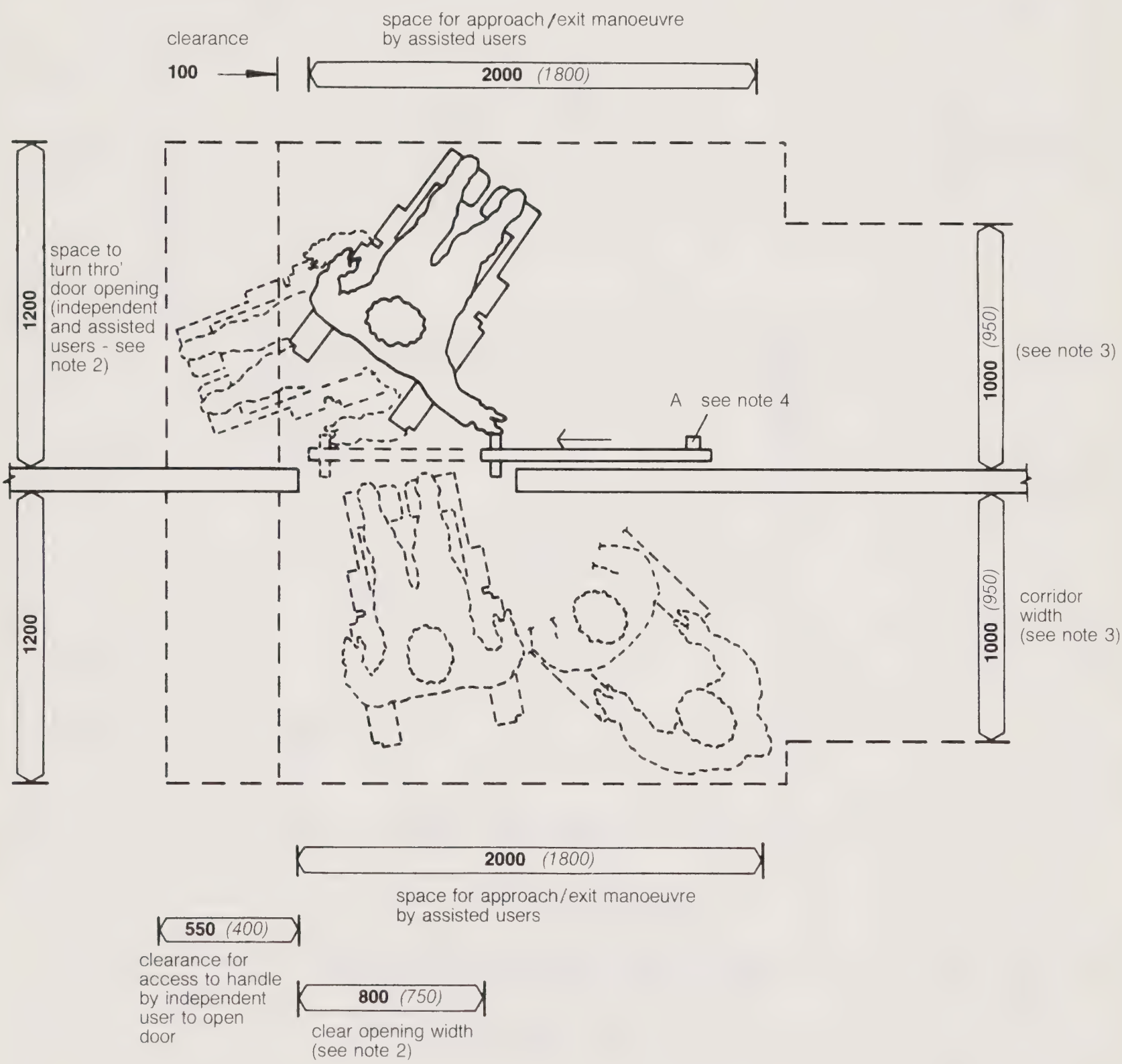
Wheelchair

1C 9

Standard DHSS 8L

Users:
Assisted and independent users.

Lateral approach



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

1. Sliding doors - provided that they can easily be operated, are often favoured by the wheelchair disabled, but tend to offer fewer advantages for the ambulant and semi ambulant.

2. It is not recommended that restricted openings be used in this position, because manoeuvring of wheelchair - for both independent and assisted conditions - is very demanding. Openings of 850-900 are preferred where lobby depth is also minimal. Where 800 opening only is possible, lobby depth of 1400 will provide more satisfactory conditions. (Where the restricted 750 opening is used a lobby depth of 1600 is desirable for safe manoeuvring through opening).

3. Passageways used frequently by wheelchair traffic should preferably be at least 1400 (1200) wide.

4. A single centrally positioned pull handle is possible in some situations, ie where they do not impede door opening.
A second handle in position 'A' is required for independent users to open door where manoeuvring space beyond door opening is not available.

Activities:
Passing through sliding door.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

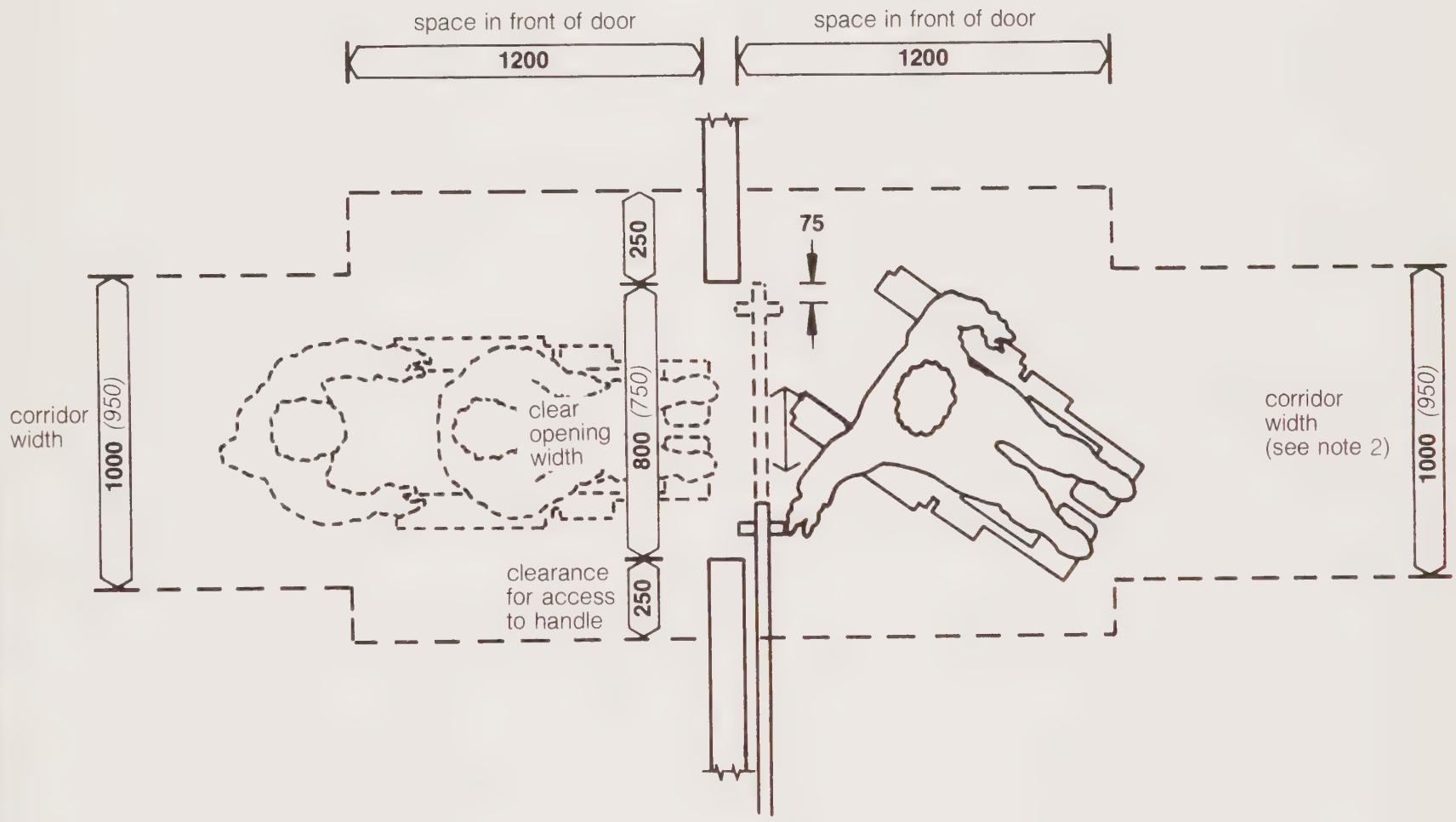
Wheelchair

1C8

Standard DHSS 8L

Users:
Assisted and independent users.

Frontal Approach



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

1. Sliding doors - provided that they can easily be operated, are often favoured by the wheelchair disabled, but tend to offer fewer advantages for the ambulant and semi ambulant.

2. Passageways used frequently by wheelchair traffic should preferably be at least 1400 (1200) wide.

3. A single centrally positioned pull handle is possible in some situations, ie where they do not impede door opening.

Trolleys/Mobile Equipment (large)

Notes

1. The drawings given relate to the movement of a theoretical maximum sized trolley (or item of equipment), 1650mm long x 750mm wide.

2. To illustrate the types of large trolleys and equipment that have to be accommodated, some typical examples are given.

3. Application of the activity dimensions given should ensure satisfactory movement of almost all types of trolley and mobile equipment. (Special consideration may be required where larger trolleys/mobile equipment are used or where the design and and weight affect the handling characteristics.)

4. Where a particular part of a circulation space has to be designed for a specific trolley/mobile equipment of known size, (eg a parking bay) adjustment of the activity dimensions given may be necessary.

5. Data is also available on small and medium-sized trolleys and equipment — see COMMON SPACES VOL 1.

6. Data is also given on SACK TRUCKS, PLATFORM TRUCKS AND PALLET TRUCKS.

Activities:
Dimensions of trolleys/mobile equipment. This data sheet should be used in conjunction with **Trolleys/mobile equipment - Large** sheets - see note 1 below.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

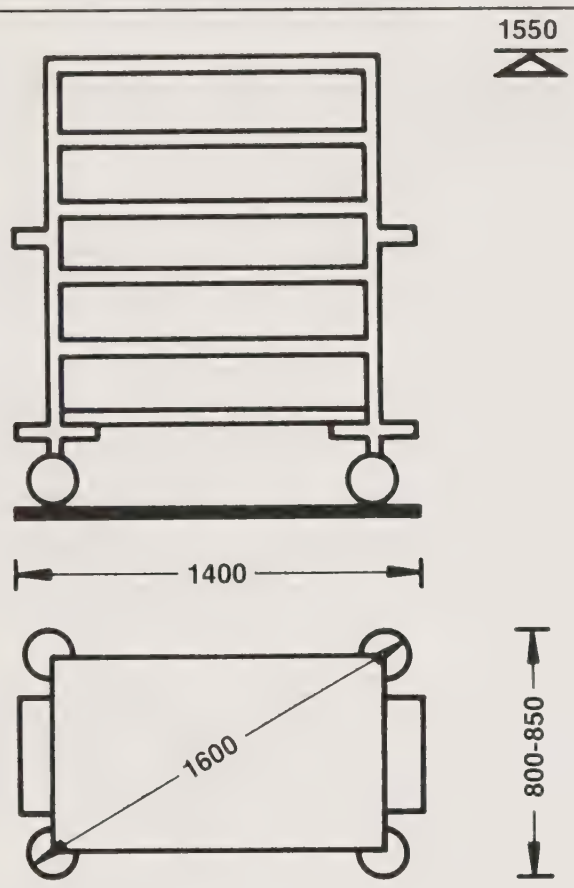
Trolleys/Mobile Equipment

8D9

Large - 1650 long x 750 wide and preferably not over 1400 high (see note 2) generally with 2 fixed castors at the front. 2 freely rotating castors at rear.

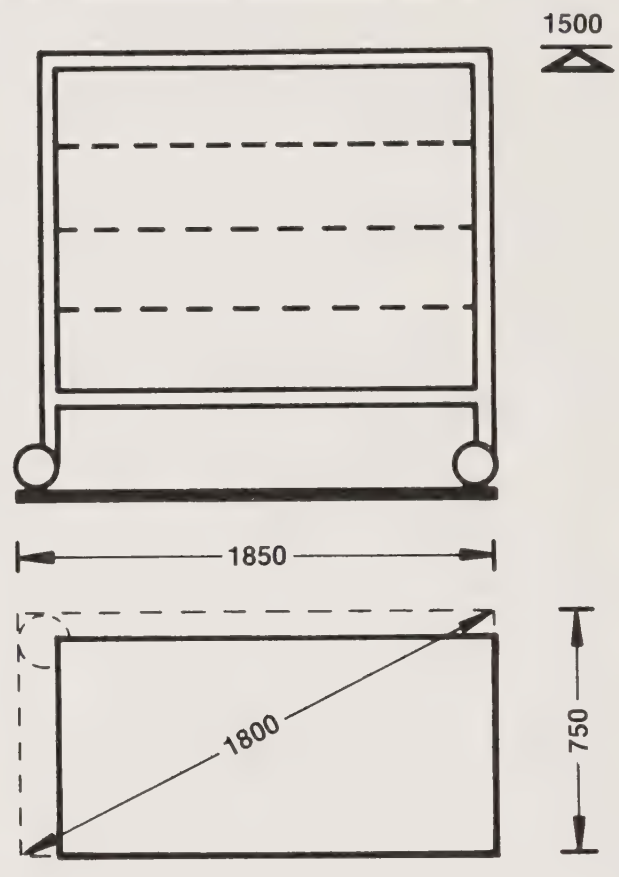
Users: Staff

TROLLEY: BREAD
5 tier



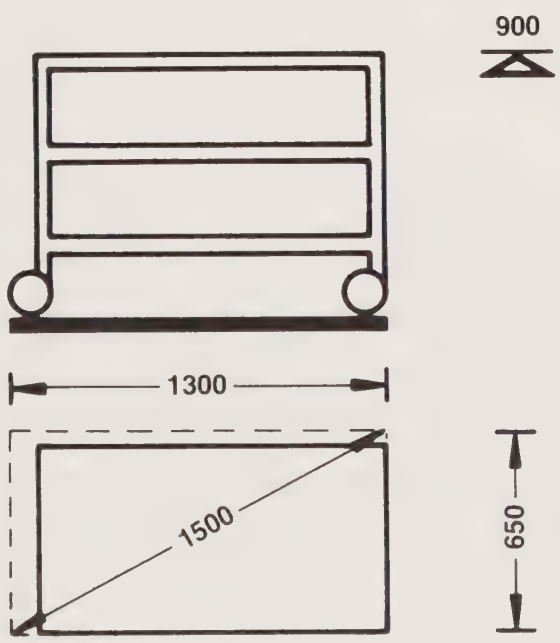
Basic width exceeds 750 max. width. 850 occurs during turning of castors only. It is recommended that 100 (50) be added to all maxoeuvring dimensions for large trolleys to accommodate frequent movements.

TROLLEY: CLEAN
LINEN, exchange



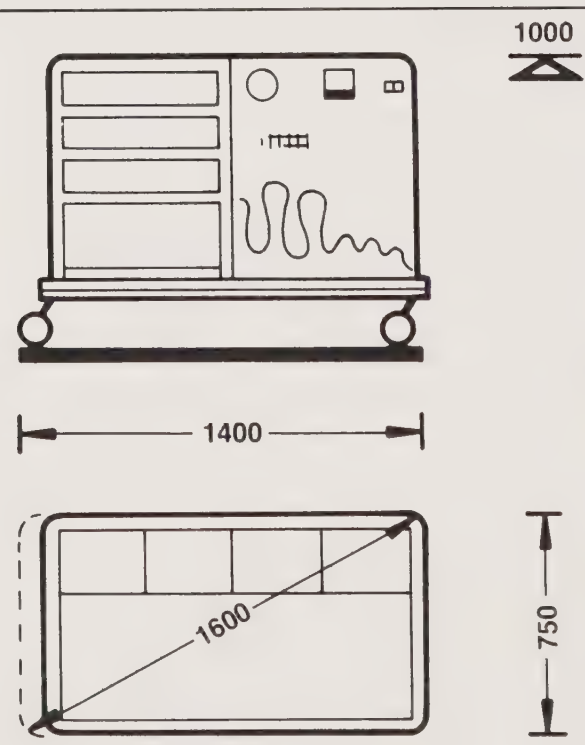
Can have 4 freely rotating castors or 2 fixed, 2 rotating.

TROLLEY: TOOL
3 tier



May have 4 freely rotating castors. Loading general heavy.

TROLLEY: RESUSCITATION



Heavy, and likely to be moved rapidly in an emergency situation. Restricted dimensions therefore should not be applied.

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. The overall modular dimensions shown relate to typical examples of trolleys for each type and are inclusive of projections such as buffers and handles, and include space taken up by castor positions.

2. Where dimensions of mobile equipment to be considered exceed 750 wide and (less critically in the case of straight movement only) 1650 long, space requirements will have to be adjusted individually. For guidance see also data sheet on **Bed** and **Patient Trolley** movement.

Activities:

Dimensions of trolley/mobile equipment. This data sheet should be used in conjunction with **Trolleys/Mobile Equipment - Large** sheets - see note 1 below.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

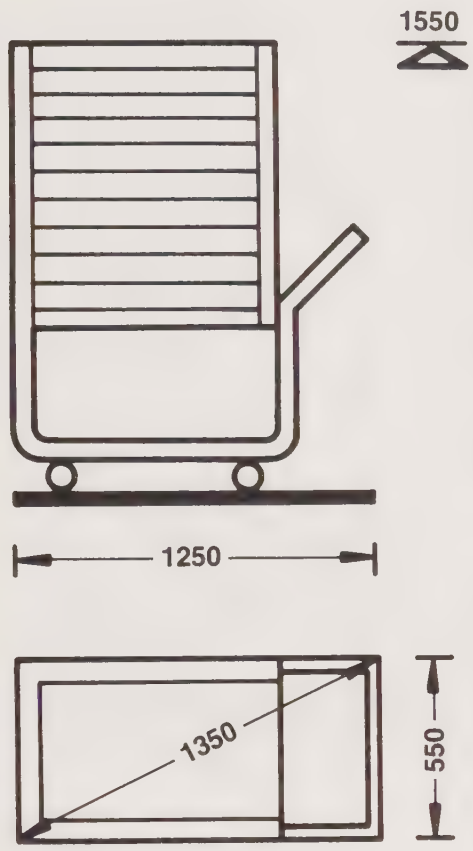
Trolleys/Mobile Equipment

8D8

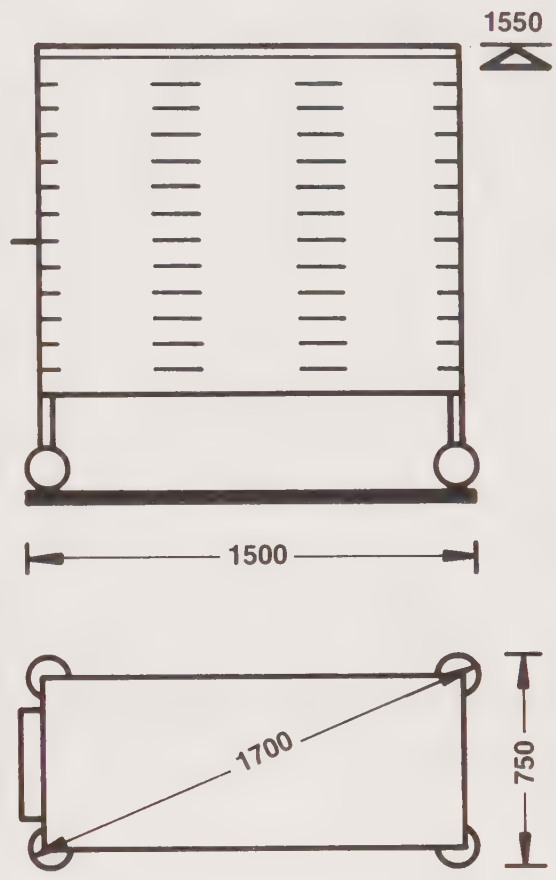
Large - 1650 long x 750 wide and pref. not over 1400 high (see note 2) - generally with 2 fixed castors at the front - 2 freely rotating castors at rear.

Users: Staff

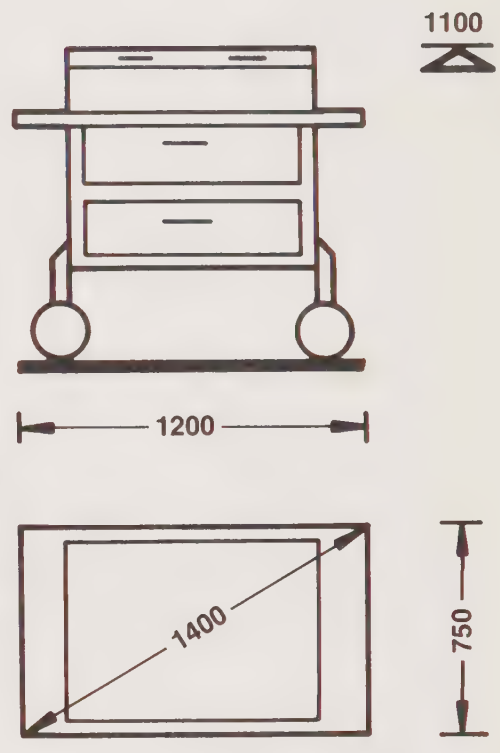
TROLLEY: BAKING TRAYS
for convection oven



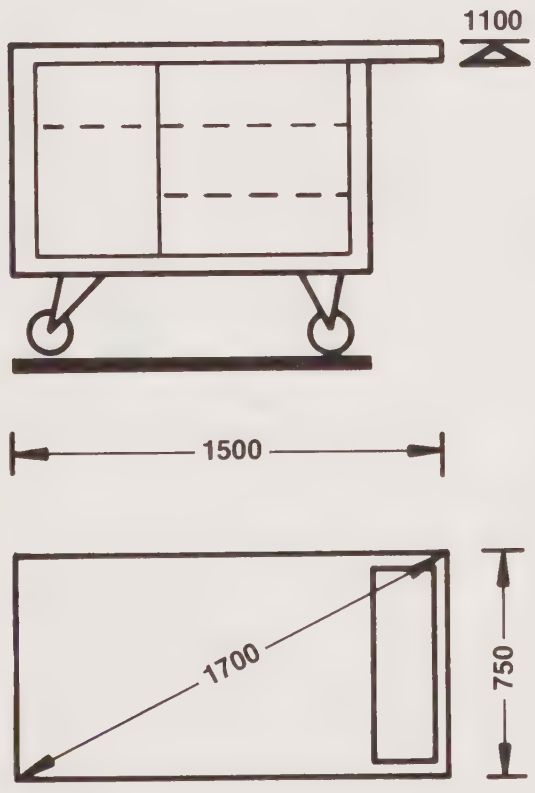
TROLLEY: FOOD SERVICE
36 trays unheated



TROLLEY: FOOD
heated

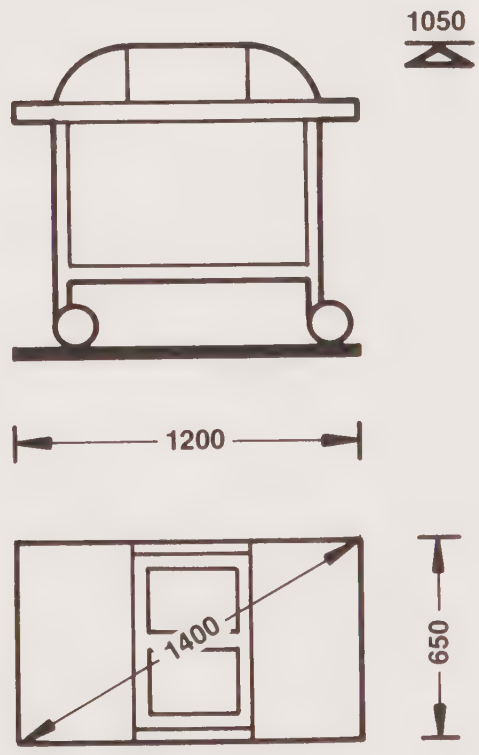


TROLLEY, DISTRIBUTION/
COLLECTION, H.S.D.U.



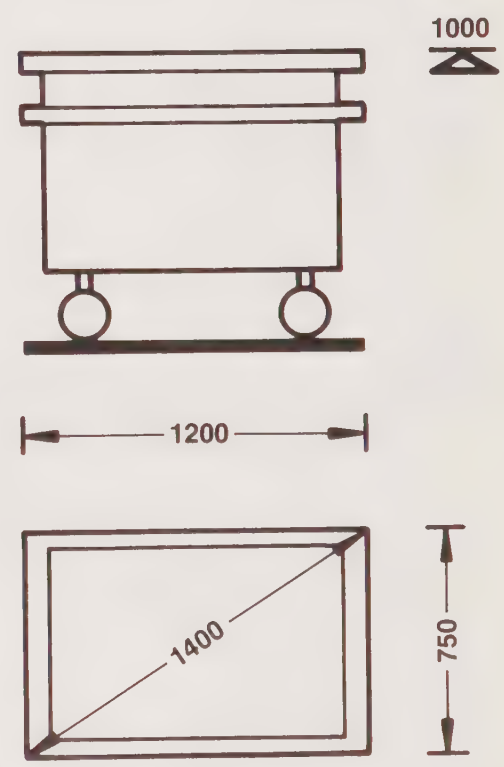
fixed rear wheels

TROLLEY: CLEARING



may have 4 freely rotating castors

TROLLEY: FOOD
SELECTION, bulk service



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. The overall modular dimensions shown relate to typical examples of trolleys for each type and are inclusive of projections such as buffers and handles, and include space taken up by castor positions.

2. Where dimensions of mobile equipment to be considered exceed 750 wide and (less critically in the case of straight movement only) 1650 long space requirements will have to be adjusted individually. For guidance see also data sheets on **Bed** and **Patient Trolley** movement.

Activities:
Pushing trolley or mobile equipment in straight line and passing through an opening.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

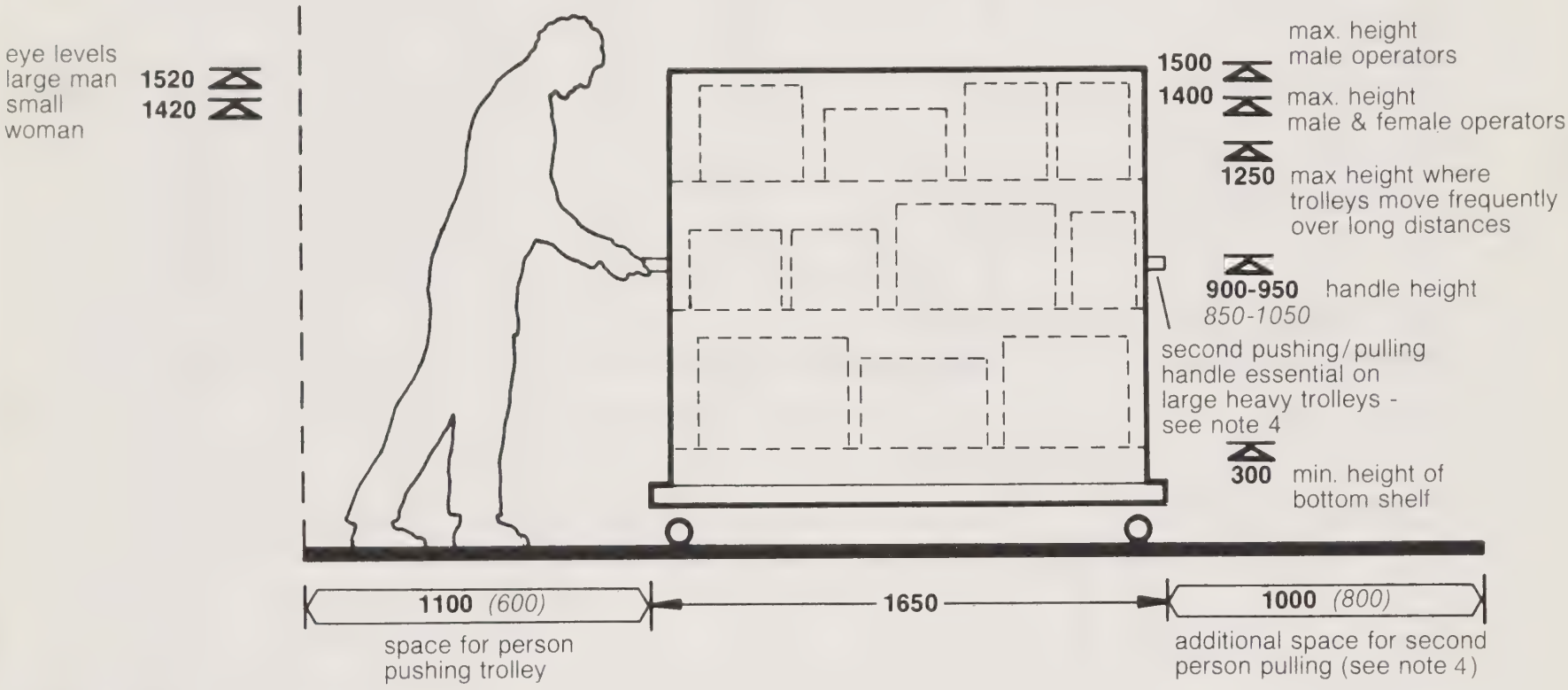
Trolleys/Mobile equipment

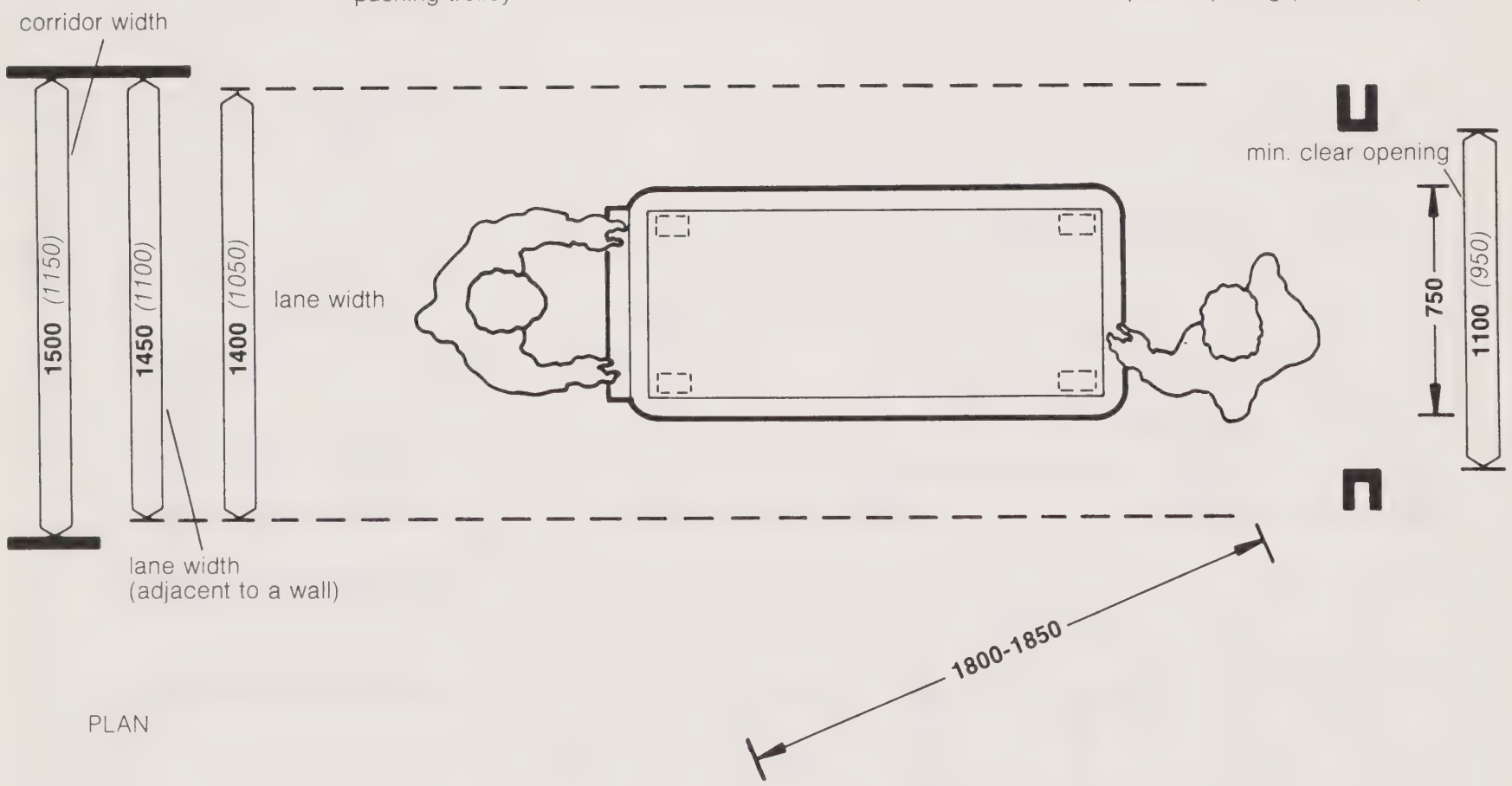
8D7

Large — 1650 long x 750 wide (loaded) pref. not over 1400 high

Users:
Staff

ELEVATION


eye levels
large man 1520
small woman 1420
1500 max. height male operators
1400 max. height male & female operators
1250 max height where trolleys move frequently over long distances
900-950 handle height
850-1050
second pushing/pulling handle essential on large heavy trolleys - see note 4
300 min. height of bottom shelf
1100 (600)
space for person pushing trolley
1650
1000 (800)
additional space for second person pulling (see note 4)



PLAN

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Activity dimensions given relate to a general purpose type, loaded trolley up to 1650 long x 750 wide.
2. It is unlikely in practice that loading that obstructs operator vision can be adequately controlled for all types of large trolleys and therefore the preferred activity dimensions given for straight movement allow space to look around side of trolley if load is too high to see over, space for normal swerving motion when moving off, and space for a second attendant pulling:
When considering lighter large trolleys where the use and general characteristics make it unlikely that the operator visibility will be obstructed reduced activity dimensions are acceptable i.e. 1350 (corridor width); 1300 (lane width adjacent to a wall); 1250 (lane width); 1050 (opening width).
3. Trolley loading — recommendations are based on a maximum trolley load of approx. 150kg (3cwts) (see also note 4. below).
4. Larger fully loaded trolleys will be too heavy for some small men and the majority of smaller women to manoeuvre alone and therefore 2 operators will be required (see also note 3 above).

Activities:
Turning trolley through 90⁰ bend in corridor

Type 1 — with 2 fixed and 2 freely rotating castors with 1 or 2 operators.

Type 2 — with 4 freely rotating castors with 2 operators.

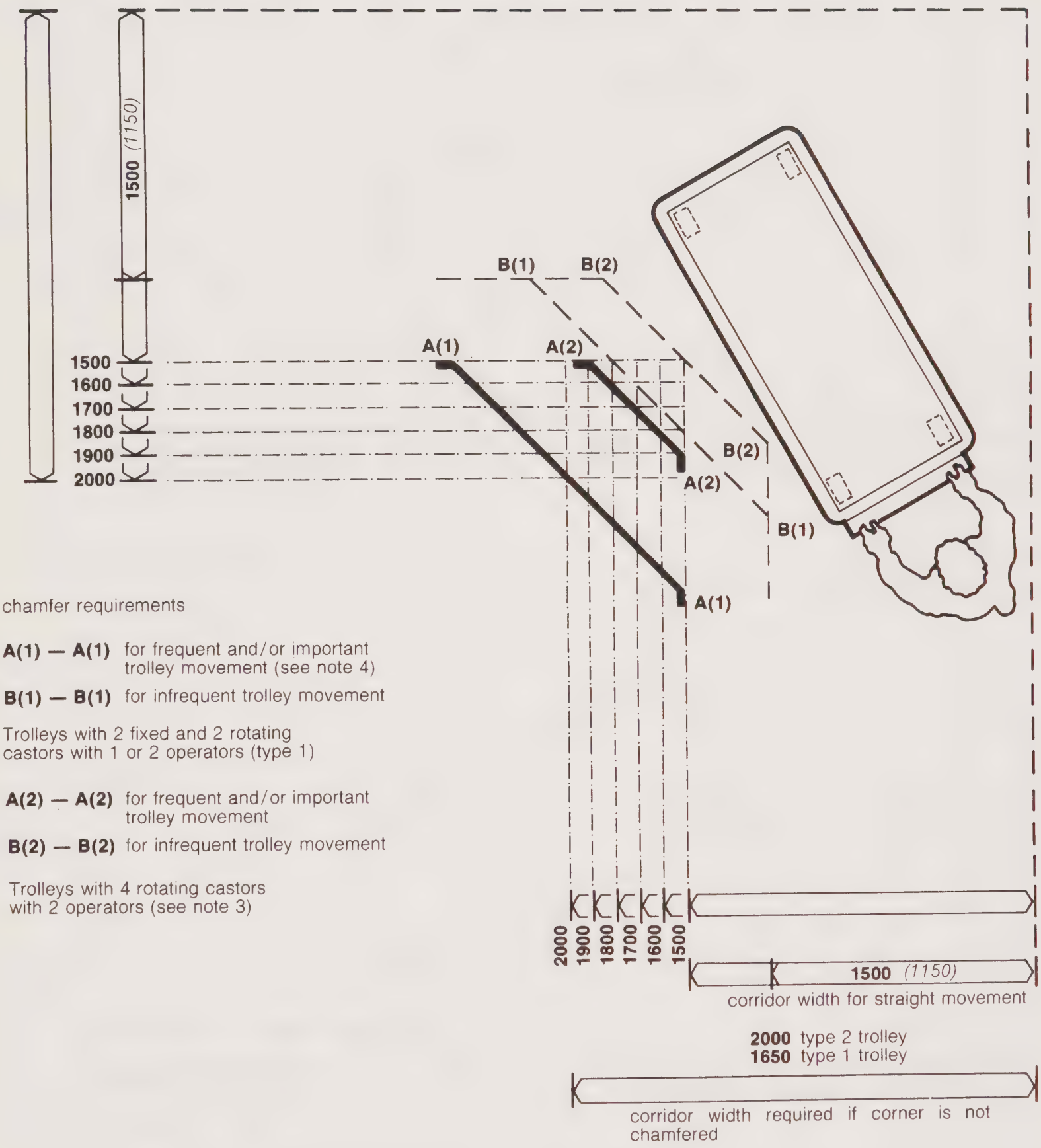
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Trolleys/Mobile equipment

8D6

Large — 1650 long x 750 wide loaded, preferably not over 1400 high

Users:
Staff



chamfer requirements

A(1) — A(1) for frequent and/or important trolley movement (see note 4)

B(1) — B(1) for infrequent trolley movement

Trolleys with 2 fixed and 2 rotating castors with 1 or 2 operators (type 1)

A(2) — A(2) for frequent and/or important trolley movement

B(2) — B(2) for infrequent trolley movement

Trolleys with 4 rotating castors with 2 operators (see note 3)

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. See notes on Trolley/Mobile equipment — Large straight movement data sheet.

2. Preferred corridor width shown allows for more rapid movement than for turning out of an opening.

3. Where a trolley with 4 freely rotating castors is pushed by one person only the chamfer requirements for trolleys with 2 fixed and 2 rotating castors should be applied i.e. A(1)—A(1), B(1)—B(1). (N.B. directional control is poor and these recommendations may be slightly restricted for this type of movement). Large heavy trolleys involved in frequent movements should always have 2 fixed and 2 rotating castors. Where it is necessary to manoeuvre large heavy trolleys with 4 rotating castors around bends greater care is essential and preferably 2 operators should be used to minimize damage and accident potential.

4. When considering lighter, larger trolleys only chamfer A(1)—A(1) can be reduced to coincide with the two 1900 corridor width lines (see also Trolley/Mobile equipment — Large, straight movement data sheet).

Activities:
Turning trolley into or out of openings of width 1000 or 1200

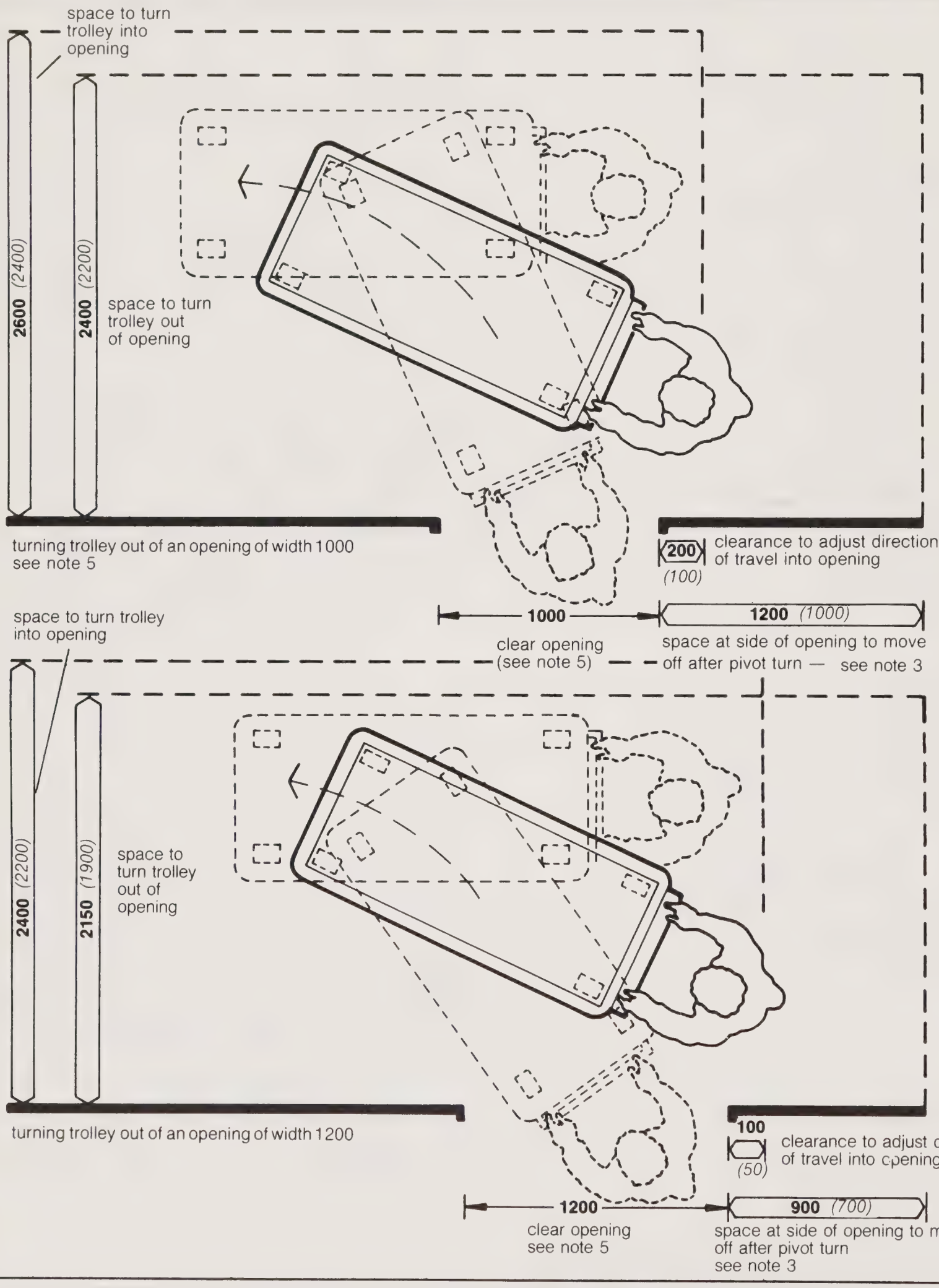
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Trolleys/Mobile equipment

8D5

Large — 1650 long x 750 wide, loaded, and preferably not over 1400 high

Users:
1 staff


space to turn trolley into opening
2600 (2400)
2400 (2200)
space to turn trolley out of opening
turning trolley out of an opening of width 1000
see note 5
200
(100)
clearance to adjust direction of travel into opening
1000
clear opening
(see note 5)
1200 (1000)
space at side of opening to move off after pivot turn — see note 3
space to turn trolley into opening
2400 (2200)
2150 (1900)
space to turn trolley out of opening
turning trolley out of an opening of width 1200
100
(50)
clearance to adjust direction of travel into opening
1200
clear opening
see note 5
900 (700)
space at side of opening to move off after pivot turn
see note 3

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. See general notes of Trolleys/Mobile equipment — Large, straight movement data sheet.

2. These recommendations are specifically for trolleys having 2 fixed front castors and 2 freely rotating rear castors. Trolleys with 4 freely rotating castors will be accommodated within these recommendations, particularly where pushed/pulled by 2 operators. The recommendations are less satisfactory for the latter where only one operator is involved. Much greater care must be exercised in this case if damage to equipment and building fabric is to be avoided.

3. Greater space to side of opening is essential where turning space outisde (lobby depth) is restricted.

4. Space dimensions given assume a fairly low speed of movement with reasonable care taken in manoeuvring to avoid damage to building fabric.

5. 1000 is a restricted opening width as it is not recommended for areas of frequent or important, large trolley movements (recommended min. clear opening — 1100).

Activities:
Turning trolleys into or out of the openings of width 1400 & 1800.

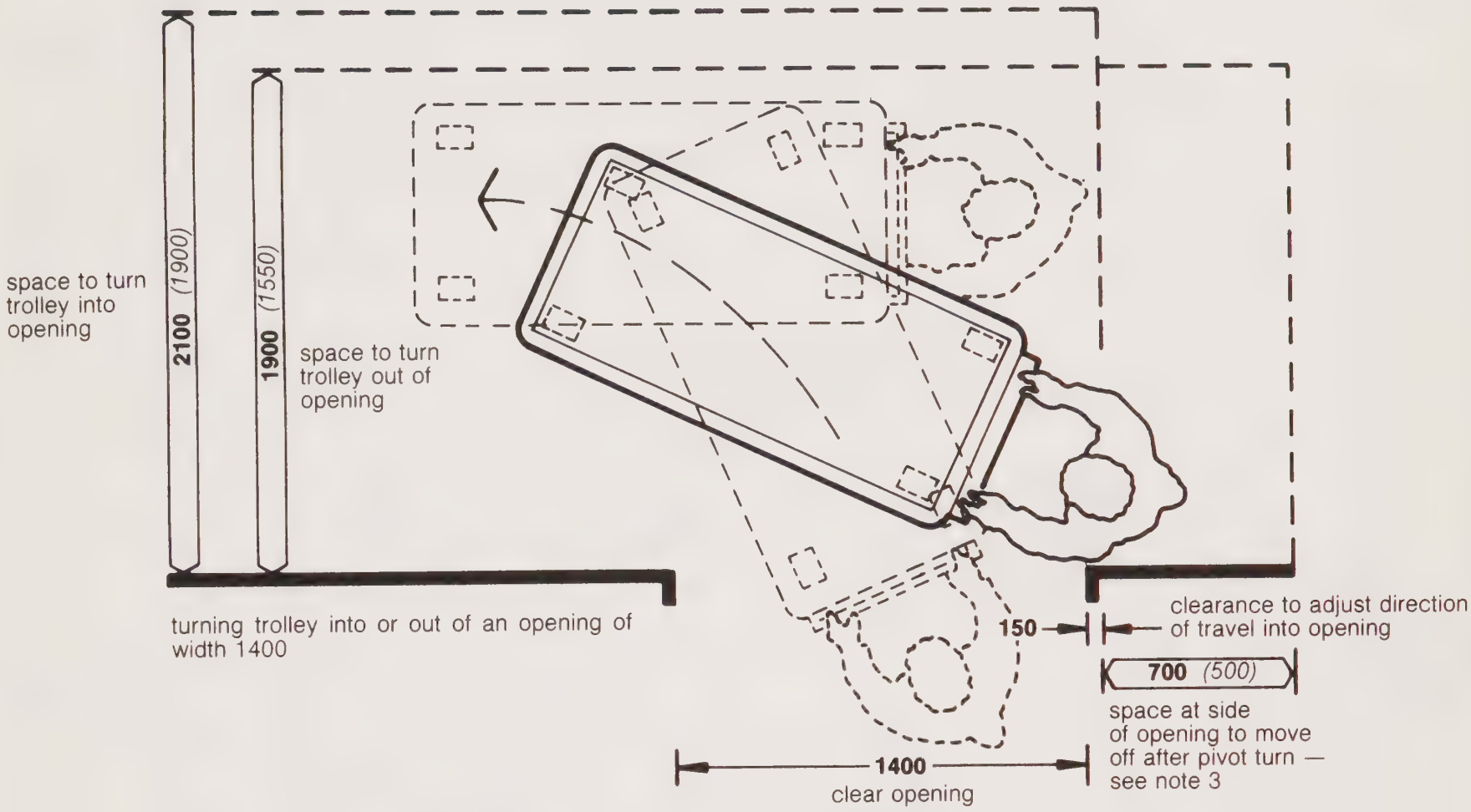
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

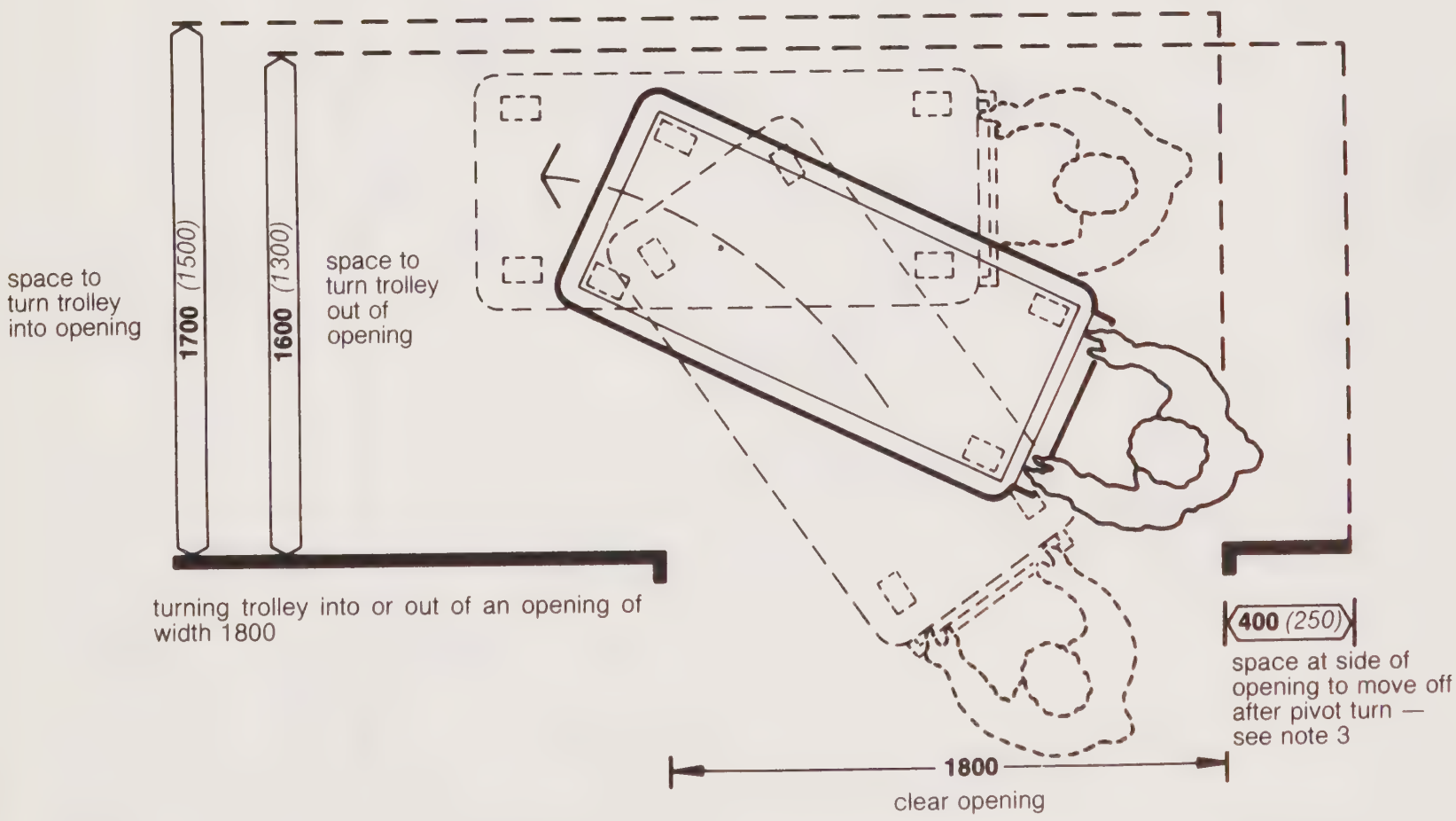
Trolleys/Mobile equipment

8D4

Large — 1650 long x 750 wide.
loaded, preferably not over 1400 high.

Users:
1 staff


space to turn trolley into opening
2100 (1900)
1900 (1550)
space to turn trolley out of opening
turning trolley into or out of an opening of width 1400
150
clearance to adjust direction of travel into opening
700 (500)
space at side of opening to move off after pivot turn — see note 3
1400
clear opening


space to turn trolley into opening
1700 (1500)
1600 (1300)
space to turn trolley out of opening
turning trolley into or out of an opening of width 1800
400 (250)
space at side of opening to move off after pivot turn — see note 3
1800
clear opening

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. See general notes on Trolleys/Mobile equipment — Large, straight movement data sheet.

2. These recommendations are specifically for trolleys having 2 fixed front castors and 2 freely rotating rear castors. Trolleys with 4 freely rotating castors will be accommodated within these recommendations, particularly where pushed/pulled by 2 operators. The recommendations are less satisfactory for the latter where only one operator is involved. Much greater care must be exercised in this case if damage to equipment and building fabric is to be avoided.

3. Greater space to side of opening is essential where turning space outside (lobby depth) is restricted.

4. Space dimensions given assume a fairly low speed of movement with reasonable care taken in manoeuvring to avoid damage to building fabric.

Activities:
Turning trolley through 90⁰ & 180⁰

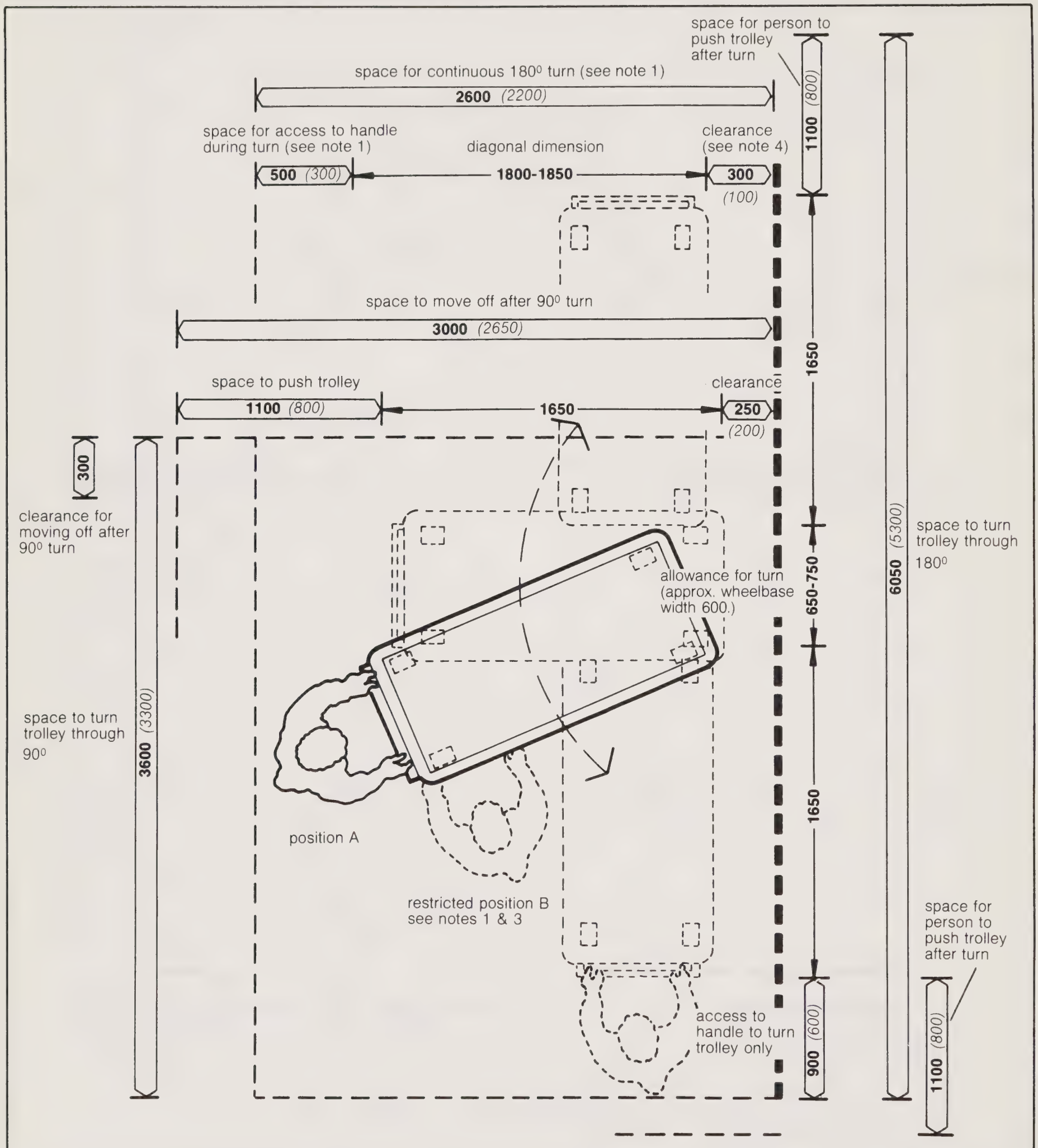
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Trolleys/Mobile equipment

8D3

Large — 1650 long x 750 wide loaded, preferably not over 1400 high

Users:
Staff



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. See also general notes on Trolleys/Mobile equipment — Large, straight movement data sheet.

2. Restricted space dimension for width of turning space (2200) allows only for person pushing/manoeuvring trolley from the side (position B).

3. The larger fully loaded storage trolleys will be too heavy for some small men and the majority of smaller women to manoeuvre alone. In such cases it must be assumed that trolleys will be handled by men only or that generally 2 operators will be involved — i.e. requiring that positions A & B be utilized simultaneously.

4. It is recommended that heavily loaded trolleys should not make contact (i.e. be pivoted against side walls because of the damage which this causes, especially to internal partitions).

5. The space required to turn a trolley is more specifically related to wheelbase width (ie 600 approx) but as some slippage normally occurs during the action of pivoting, a space allocation equivalent to overall trolley width is more realistic (i.e. 750).

Activities:
Parking trolley (between obstructions) at 90° to wall

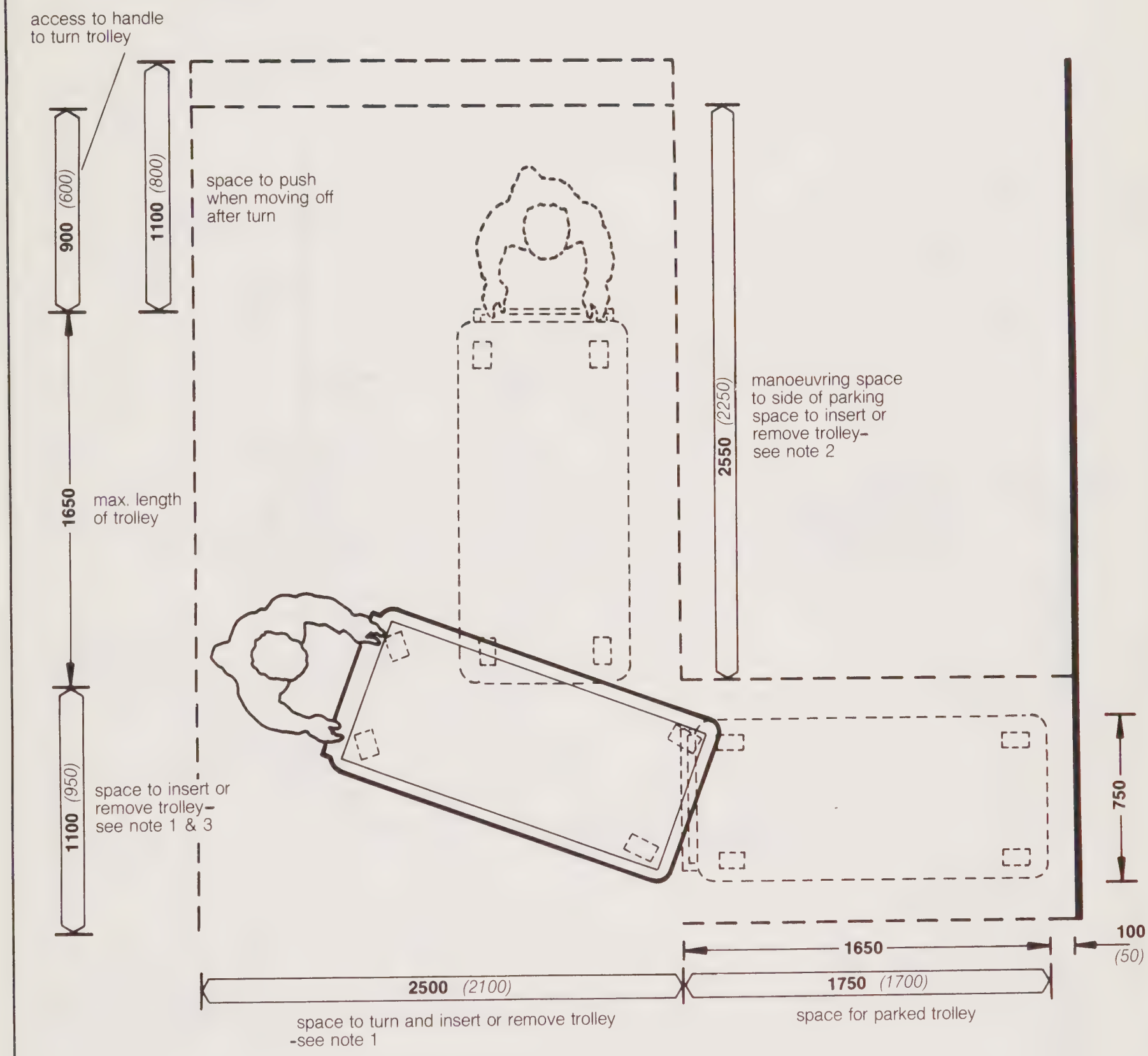
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Trolleys/Mobile equipment

8 D 2

Large — up to 1650 x 750, preferably not over 1400 high.

Users:
Staff


access to handle to turn trolley
900 (600)
1100 (800)
space to push when moving off after turn
2550 (2250)
manoeuvring space to side of parking space to insert or remove trolley– see note 2
1650
max. length of trolley
1100 (950)
space to insert or remove trolley– see note 1 & 3
750
100 (50)
1650
2500 (2100)
1750 (1700)
space to turn and insert or remove trolley -see note 1
space for parked trolley

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The preferred depth of approach space in front of parking space allows for some realignment of trolley before entry into parked position. This is generally not possible when the approach space is restricted, and consequently the restricted approach space dimension should not be used where available parking space width is also restricted.

2. Preferred dimension desirable for all loaded trolleys.

3. 950 is also recommended unit width for calculating overall trolley parking space requirements.

4. See also general notes on Trolleys/Mobile equipment — Large, straight movement data sheet.

Activities:
Parking trolley (between obstacles) parallel to wall

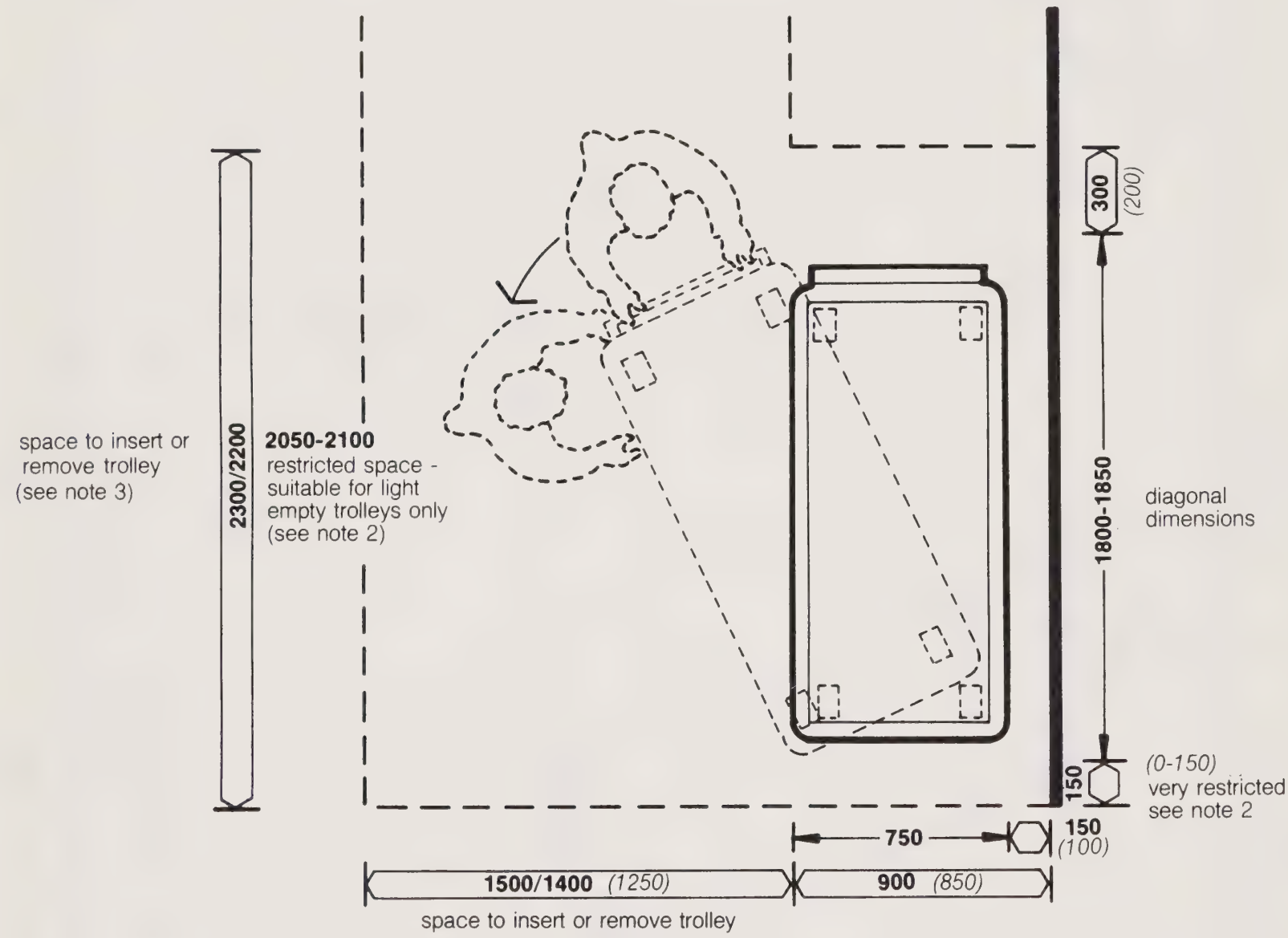
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale.

Trolleys/Mobile equipment

8 D 1

Large — up to 1650 x 750 preferably not over 1400 high.

Users:
Staff



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Due to size and weight of trolley, trolley should be parked by carefully steering front end of trolley into parking space and swinging rear end round to final parked position. This applies equally to trolleys with 4 freely rotating castors, as well as those with 2 fixed leading castors where the manoeuvre is essential. For trolley removal the manoeuvre is reversed. There is no significant difference between the manoeuvring space required by the two types of trolley.

2. Parking position is located when buffer makes contact with buffer of adjacent trolley in trolley parking zone. This must be executed with care, and is suitable for empty trolleys only, and should definitely not be used where contact is with internal partition walls. It is recommended that 2100 be used as the minimum unit length per parked trolley space when calculating overall parking space requirements for large trolleys.

3. The second preferred dimension refers only to lighter large trolleys where the height, use and general characteristics of the trolley make it unlikely that operator visibility will be obstructed.

4. See also general notes on Trolleys/Mobile equipment — Large straight movement data sheet.

Activities
Straight movement, corridor widths, lane widths, opening widths.

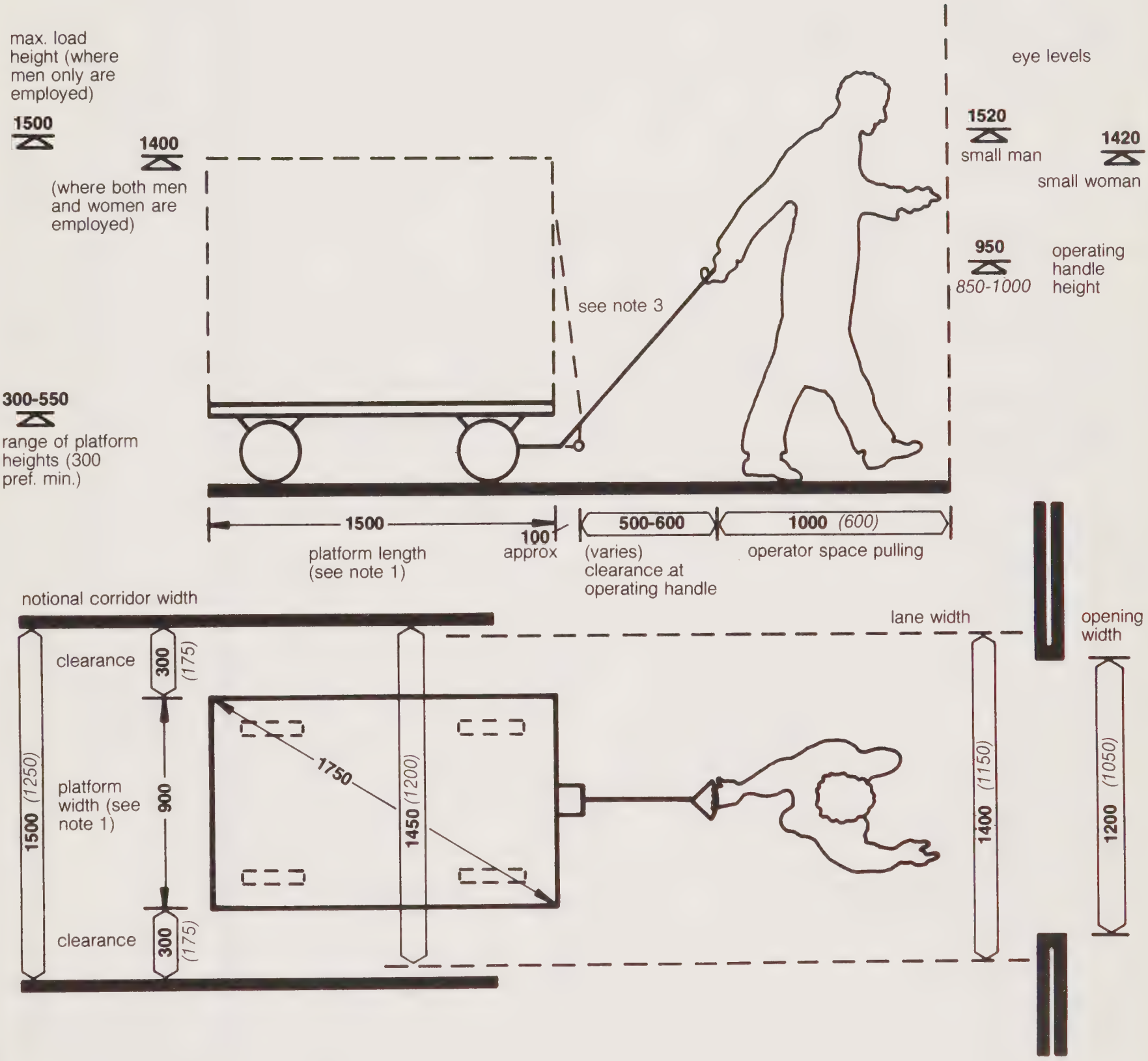
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8C7

Platform truck

Hand operated

Users:
Staff — porters/storemen



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Truck dimensions — size of platform shown is typical maximum (1850 x 1000 max. also available, but is not recommended, as it is difficult to handle manually when loaded).
2. Activity dimensions assume dimensions of load do not exceed platform dimensions.
3. Spring loaded handles are recommended.

Activities:
Moving around 90° bend
Turning into or out of a minimum width opening

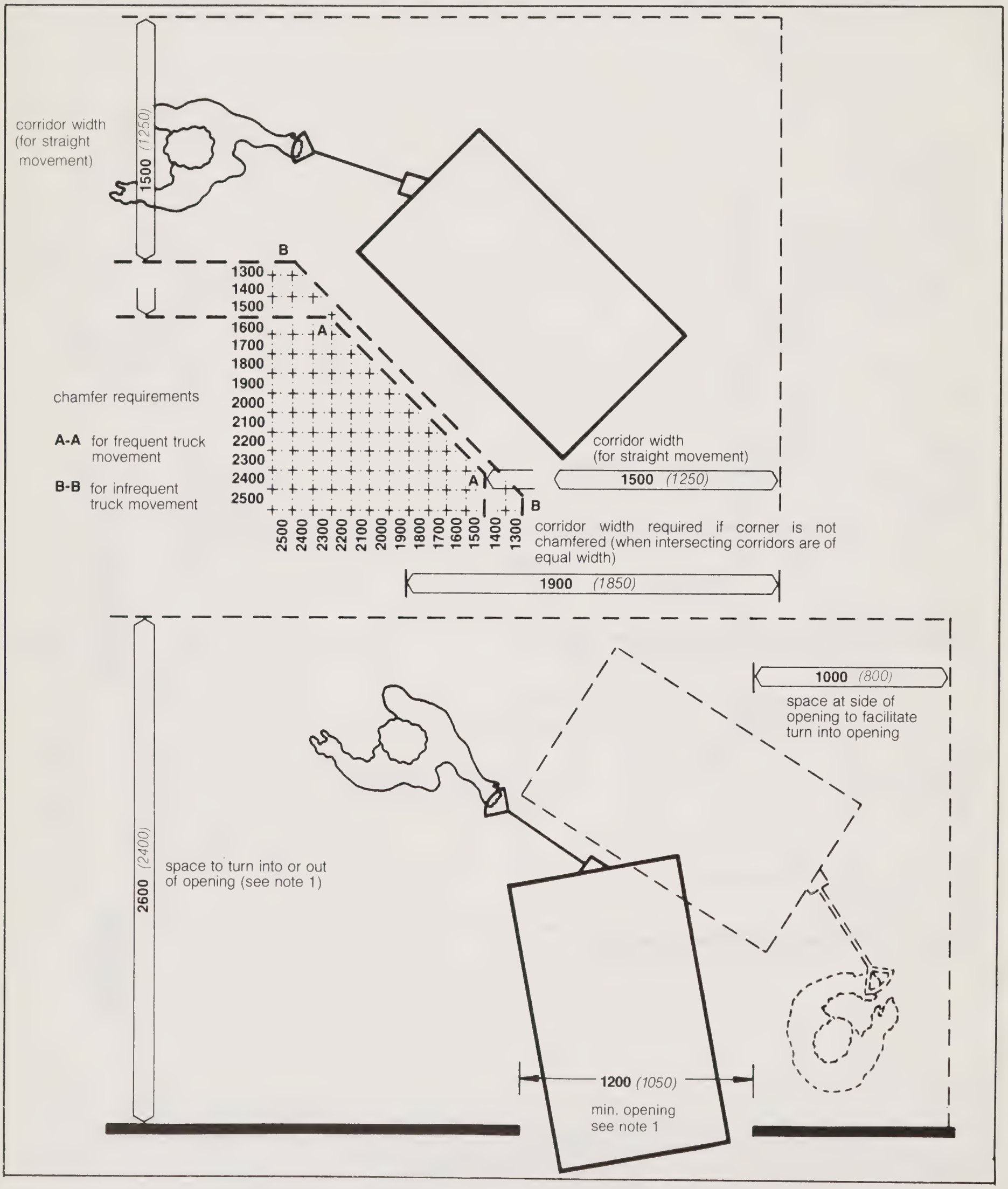
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8.C.6

Platform truck

Hand operated

Users:
Staff — porters/storemen



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Restricted dimensions for corridor turning space and opening width must not be used concurrently i.e. where corridor width is restricted (2400) clear opening must be at least 1200; and where opening is restricted (1050) corridor depth must be 2600 or greater.

Activities:
Turning through 90⁰ or 180⁰

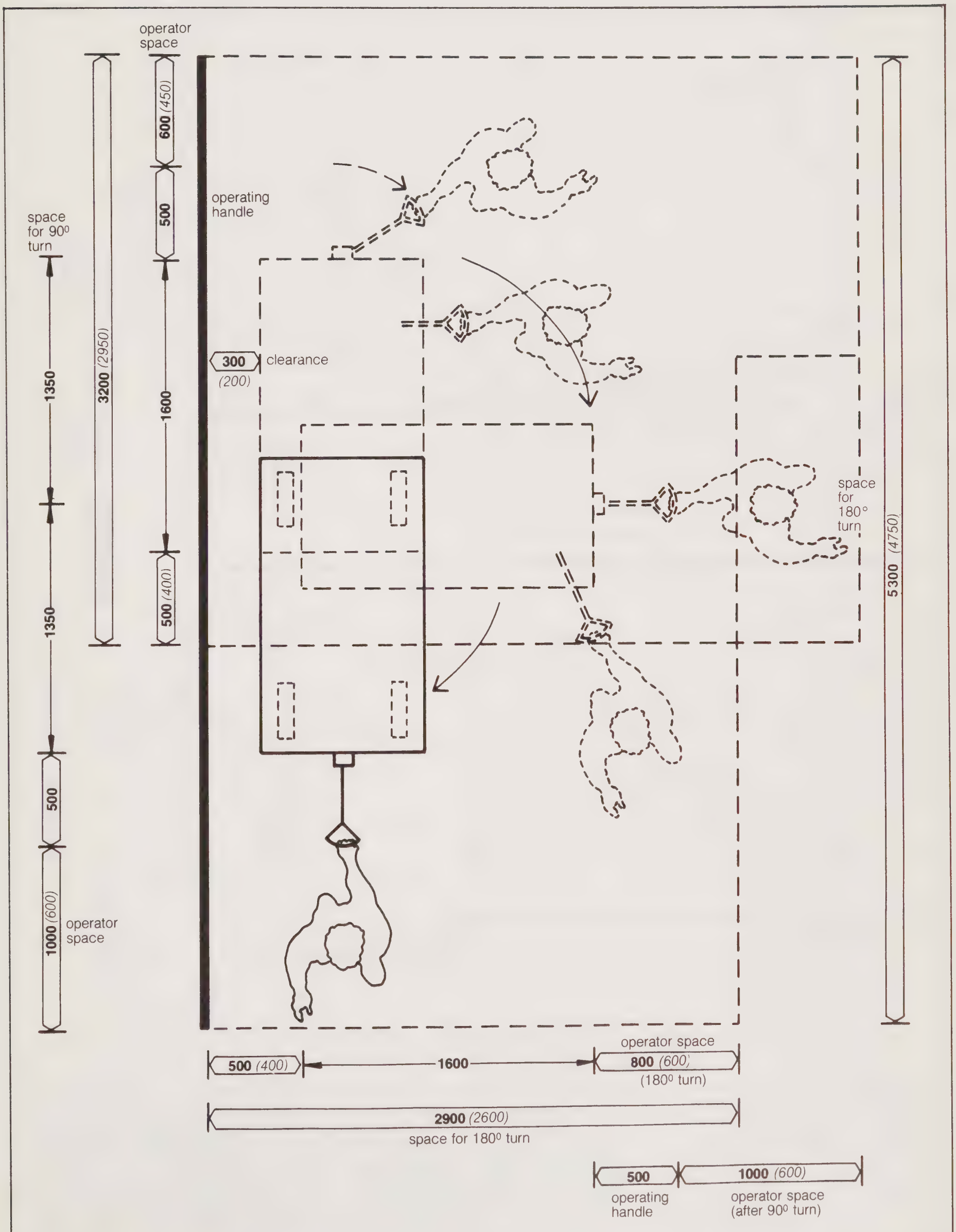
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Platform truck

8C5

Hand operated

Users:
Staff — porters/storemen



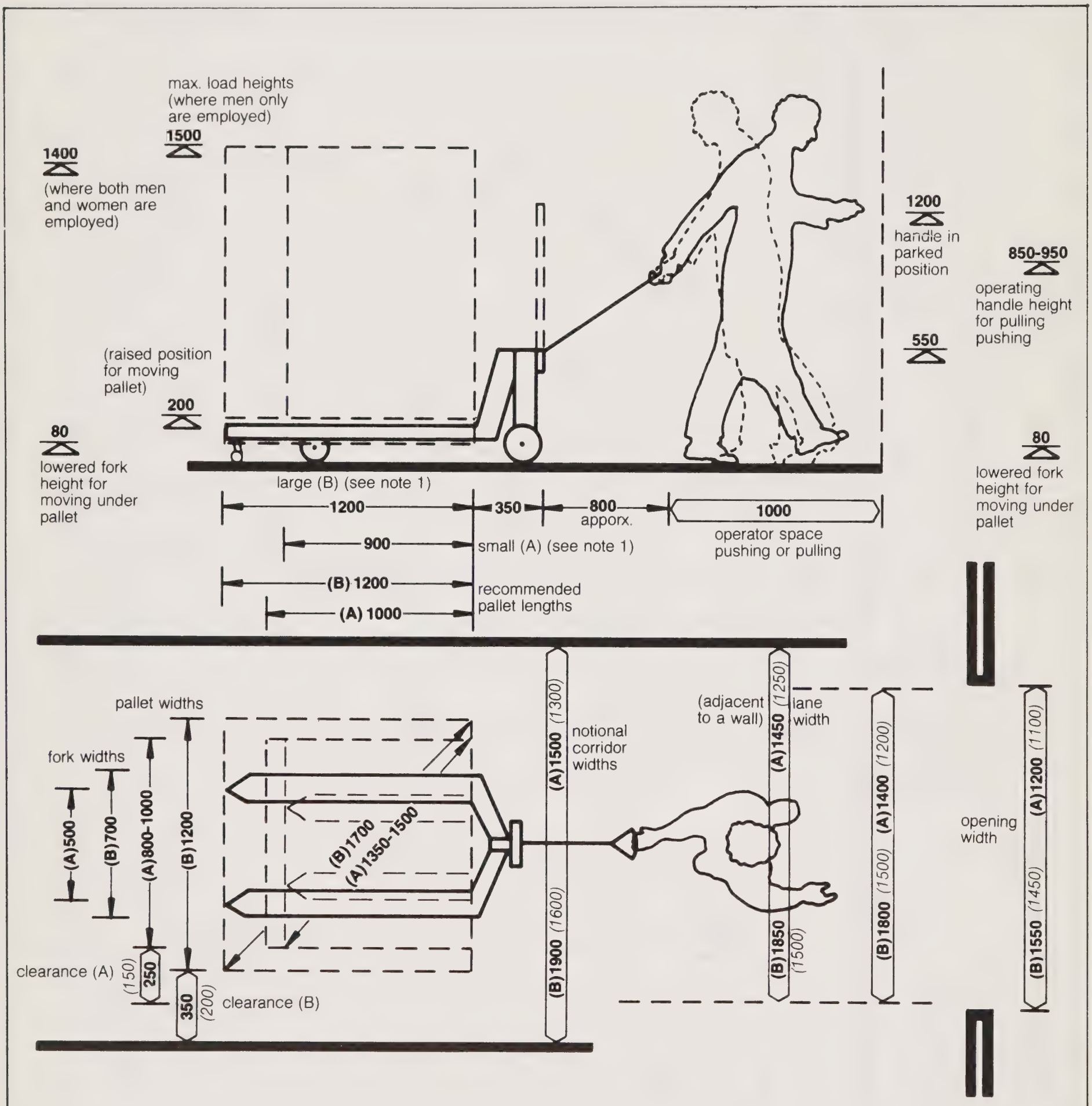
Activities:
Straight movement, corridor widths, lane width, opening width.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8C4

Pallet truck
Hand operated

Users:
Staff — porters/storemen



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Two sizes of pallet truck are shown. ie **(A)** small — with fork length of 900 and overall fork width of 500. **(B)** large — with fork length of 1200 and overall fork width of 700.
Standard sizes of pallet — 1000 x 800, 1200 x 800, 1200 x 900, 1200 x 1000, 1200 x 1200, Capacity (max) 10 cwt. 508 kilos.

2. In the interest of safety loading of pallets should not exceed 1/3 x fork length and preferably not exceed 2/3 fork width (it is dangerous to exceed 2 x fork width). Where pallets only 800 or 900 wide are used clear openings of 1000 (900) or 1100 (1000) respectively can be used, but this is restrictive for most working situations.

3. Activity dimensions refers to movements in stores and industrial areas only. Where frequent movements occur in patient areas add 150 (100) to circulation widths and 100 (50) for openings.

Activities:
Moving around 90⁰ bend
Turning into and out of opening of minimum width

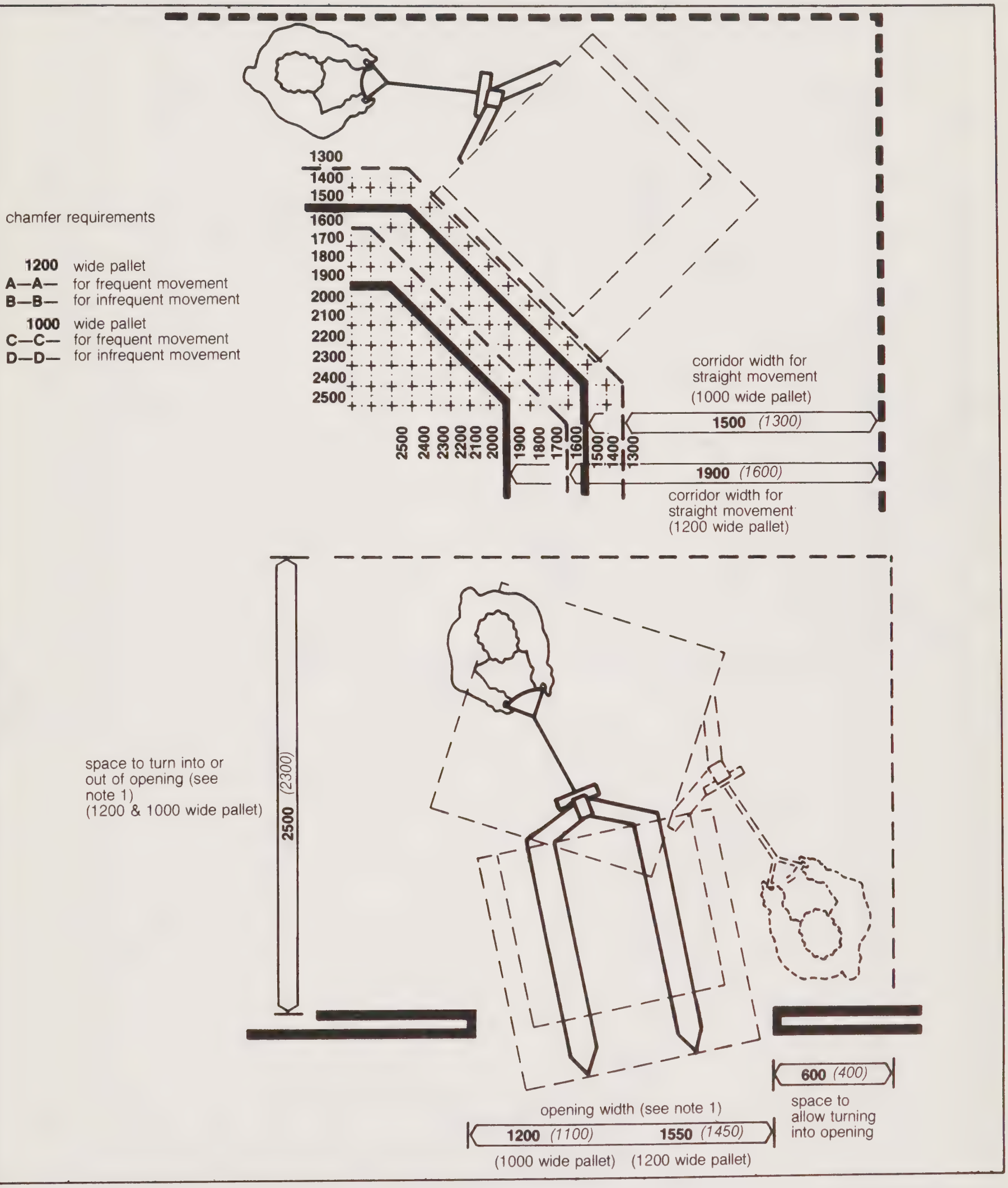
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Pallet truck

8C3

Hand operated

Users:
Staff — porters/storemen



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Restricted dimensions for corridor turning space and opening widths must not be used concurrently i.e. where opening width is restricted corridor depth must be 2500, or where corridor depth is (2300) minimum opening width must be 1200 and 1550 respectively.

Activities:
Turning through 90⁰ and 180⁰

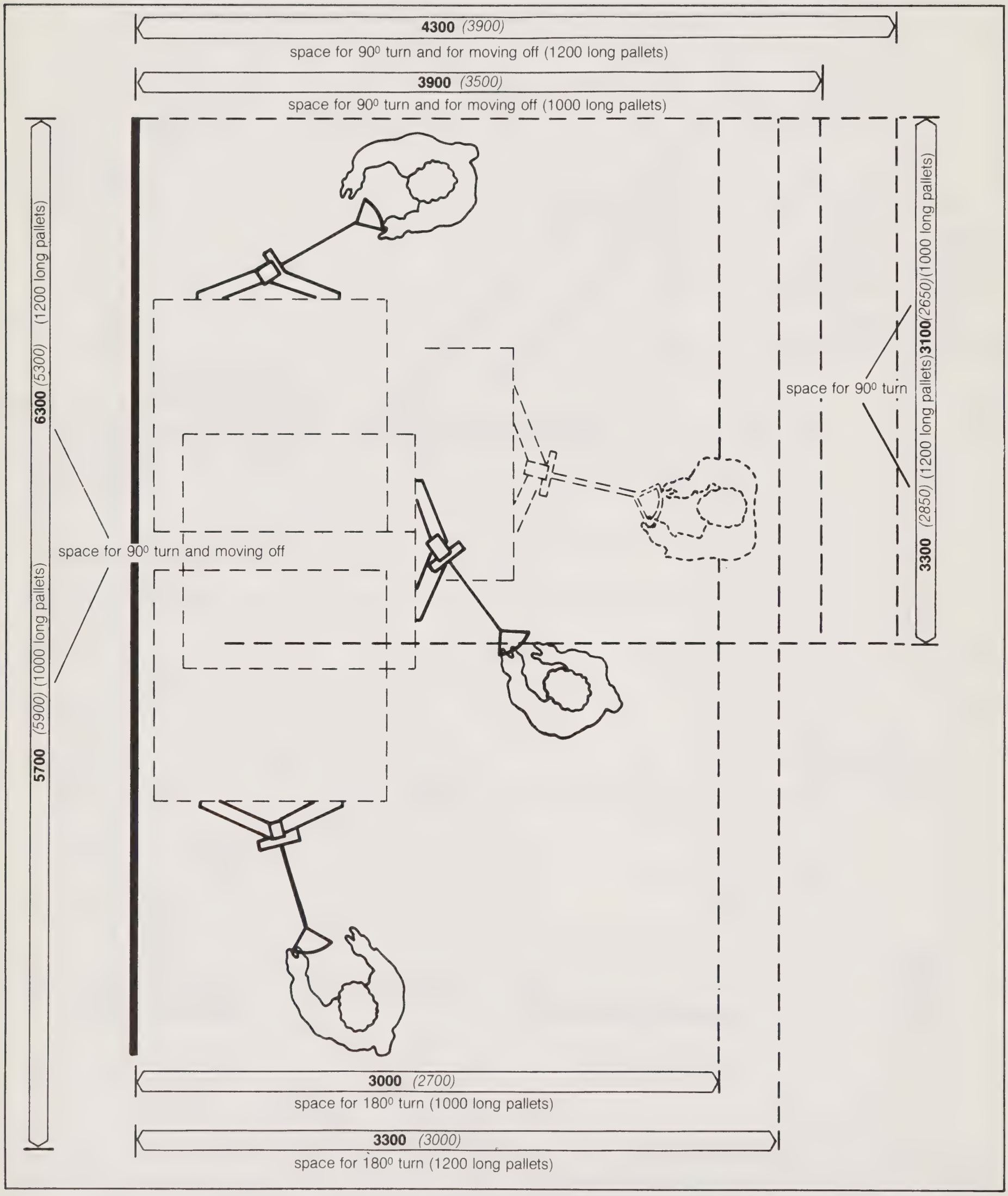
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8C1

Pallet truck

Hand operated

Users:
Staff — porters/storemen


4300 (3900)
space for 90⁰ turn and for moving off (1200 long pallets)
3900 (3500)
space for 90⁰ turn and for moving off (1000 long pallets)
6300 (5300) (1200 long pallets)
5700 (5900) (1000 long pallets)
space for 90⁰ turn and moving off
space for 90⁰ turn
3100 (2650) (1200 long pallets) 3300 (2850) (1000 long pallets)
3000 (2700)
space for 180⁰ turn (1000 long pallets)
3300 (3000)
space for 180⁰ turn (1200 long pallets)

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Activities:
Parking spaces
Turning into and out of parking spaces

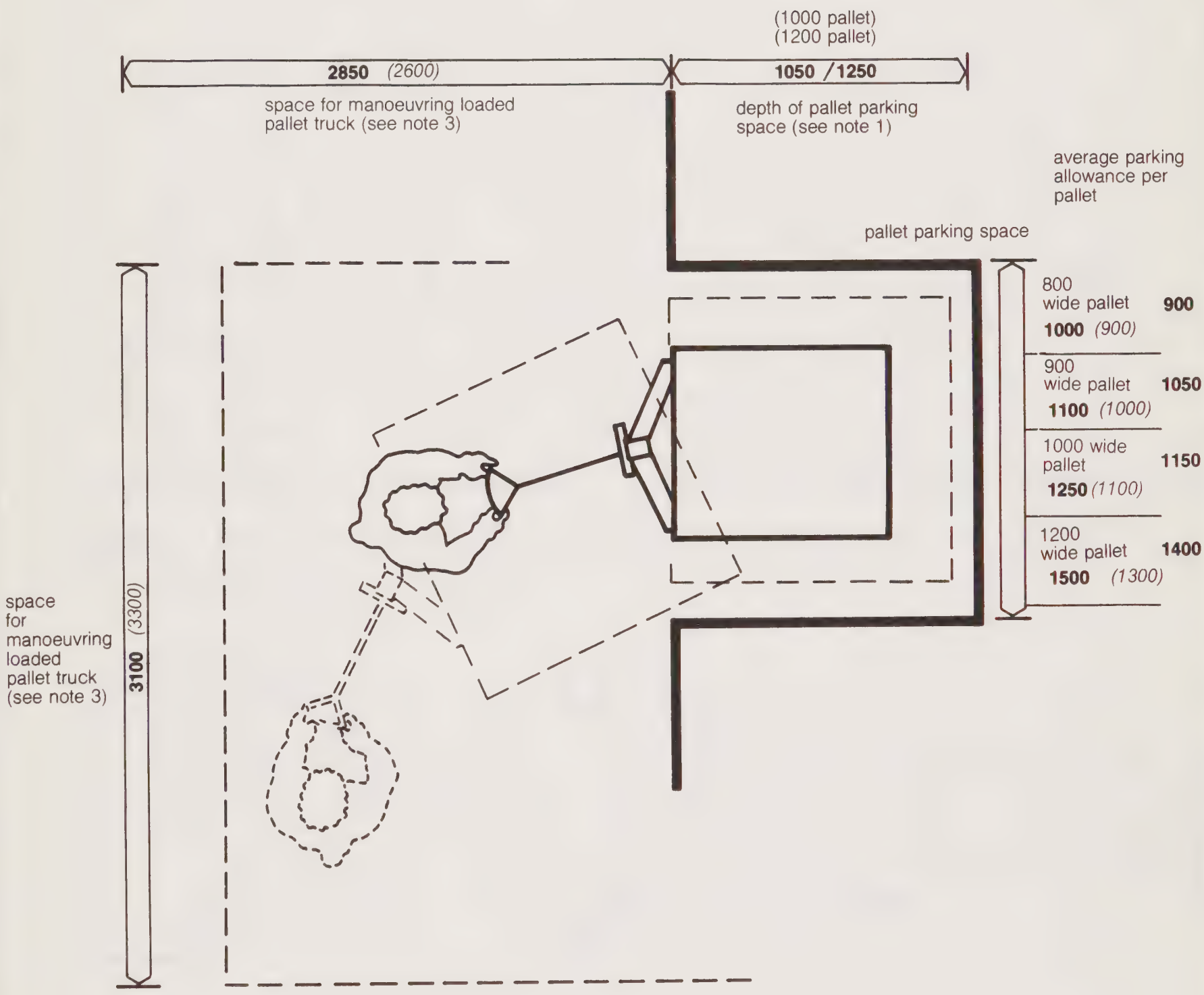
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8C2

Pallet truck

Hand operated

Users:
Staff — porters/storemen



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Add 100 (50) where loads must be stored clear of back wall.

2. Pallet sizes — in the interests of safety, loading of pallets should not exceed 1/3 x fork length, and preferably not exceed 2/3 x fork width. (It is dangerous to exceed 2 x fork width).

3. For large pallet trucks only handling 800, 900 or 1000 deep pallets, proportional reductions of 400, 300 and 200 respectively are possible in manoeuvring spaces. For small pallet trucks a reduction of 200 is possible where only 1000 and 800 deep pallets will be manoeuvred.

Activities:
Tilting loaded truck into position for moving off.
Pushing loaded truck into a straight line and through an opening.

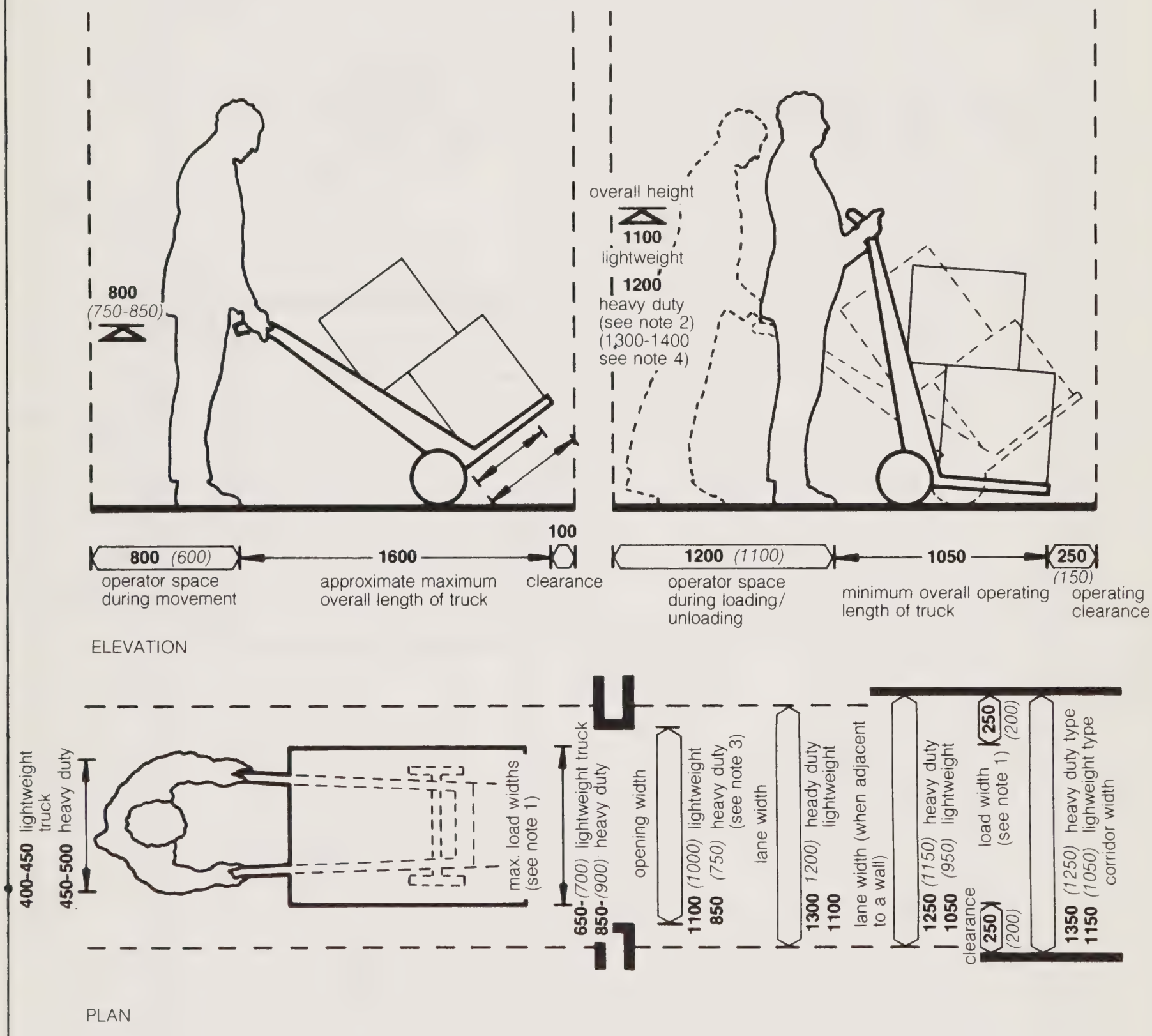
DHSS **Ergonomic data bank:**
Component user data sheet, not to scale

Sack Truck

868

Lightweight, heavy duty

Users:
Staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Sizes of objects carried: Load width should not significantly overhang either side of truck platform of foot width by more than 1/3 x width of platform/support. (The dimensions in () brackets are absolute max. load widths - see also note 3)

2. Loading:
Lightweight sack truck - 100 to 200 kgs
Heavy duty - up to 300 kgs. (Heavy duty sack trucks are recommended for male use only).

N.B. Very heavy duty sack trucks with carrying capacities of 400 to 500 kgs are also available, but in view of the excessive loads involved, their use cannot be recommended. Platform trucks should be used for all loads over 300 kgs and for lesser loads where load characteristics make the use of a sack truck potentially hazardous or impose unnecessary strain upon operators.

3. Restricted widths of openings are not recommended with the absolute maximum load widths.

4. Diameter of handles - 35 (30 min.-40 max. acceptable range).

Activities:
Turning loaded truck around 90° bend in a corridor

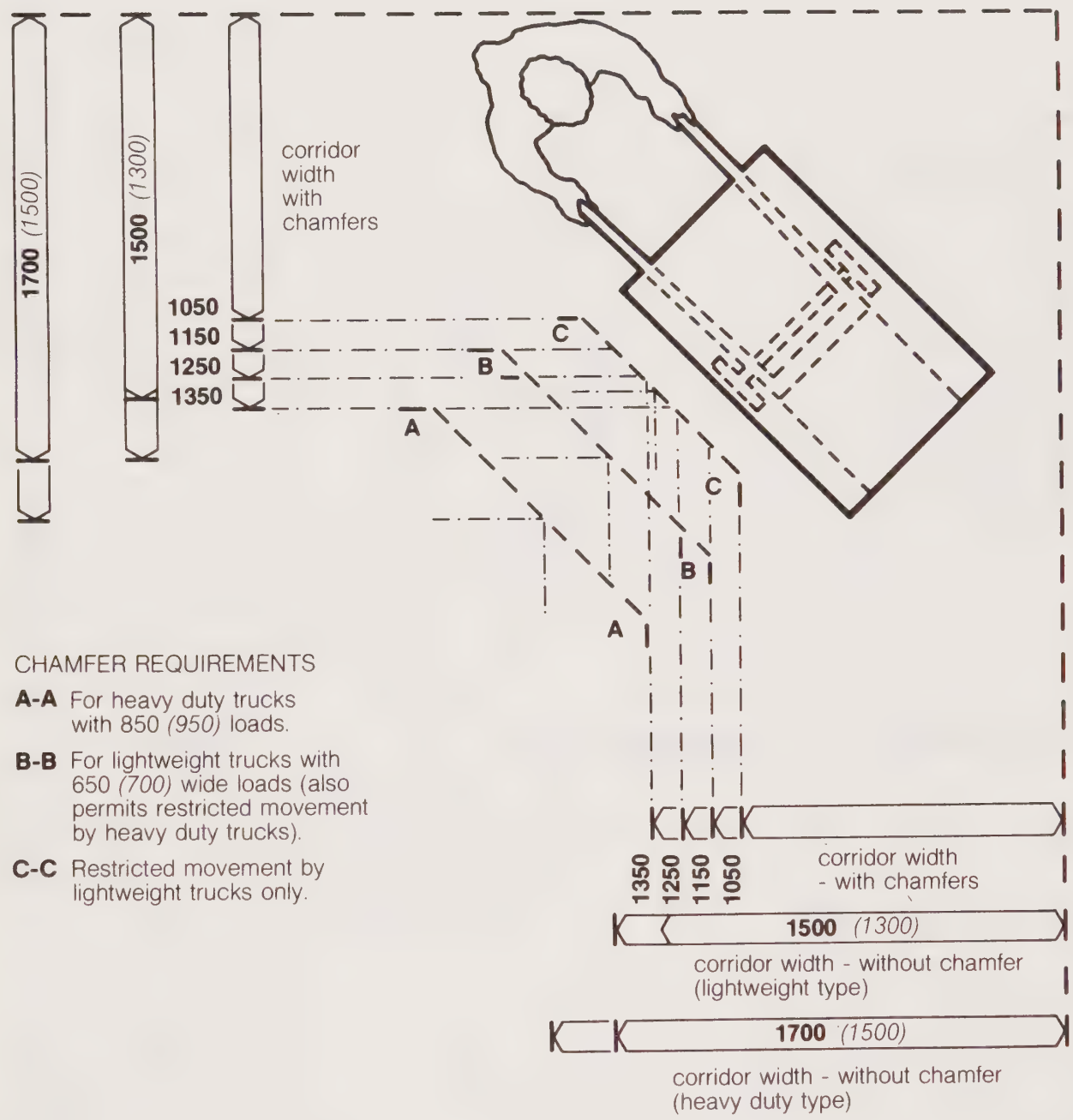
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8G10

Sack Truck

Lightweight, heavy duty

Users:
Staff



CHAMFER REQUIREMENTS

A-A For heavy duty trucks with 850 *(950)* loads.

B-B For lightweight trucks with 650 *(700)* wide loads (also permits restricted movement by heavy duty trucks).

C-C Restricted movement by lightweight trucks only.

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. See also notes 1 & 2 on **Sack Truck** straight movement data sheet.
2. Restricted opening widths are not recommended when turning space is also restricted.

Activities:
Turning loaded truck into a narrow opening.

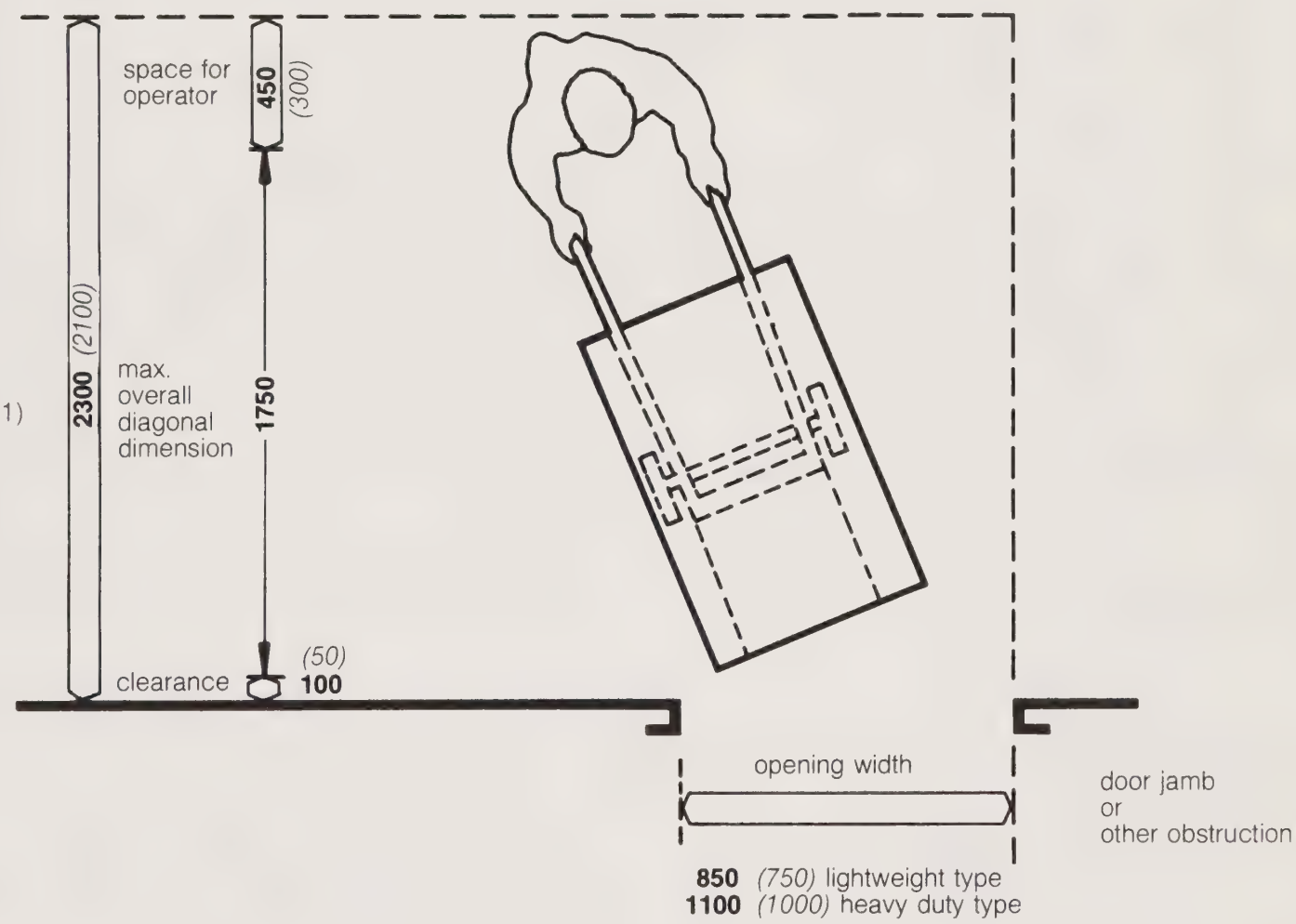
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8G9

Sack Truck

Lightweight, neavy duty

Users:
Staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. See also notes 1 & 2 on **Sack Truck** straight movement data sheet.
2. Restricted opening widths are not recommended when turning space is also restricted.

Activities:
Turning loaded truck through 90° and 180°

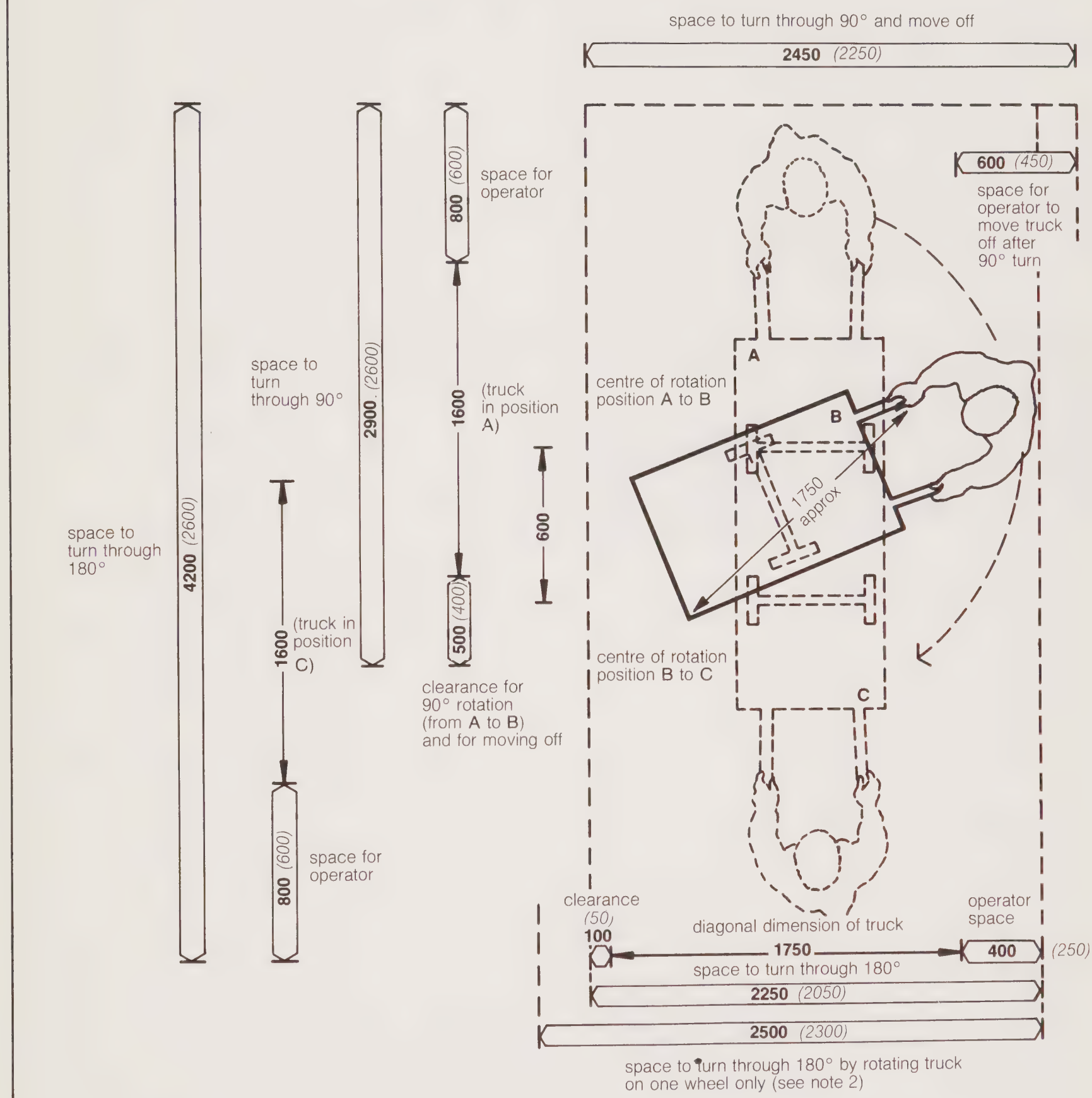
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8G11

Sack Truck

Lightweight, heavy duty

Users:
Staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. See also notes 1 & 2 on **Sack Truck** straight movement data sheet.
2. Restricted turning space dimensions are not recommended for heavy duty trucks as excessive damage to building fabric and equipment is likely to occur during normal use.
3. Preferred turning space for heavy duty trucks.

Tugs and Trains

Notes

1. The dimensions given relate to a typical 3-wheeled electric tug pulling 4 trolleys. This is a commonly used arrangement, with 4 trolleys being a usual maximum especially where ramps are used.

2. Trolley design is critical. In order to ensure stability and good tracking it is important that the tow bars are of the correct length and that they are permanently attached to the rear of each trolley, and that the 2 fixed wheels are also at the rear of the trolleys. (Other types of equipment will require different space requirements for movement from those given.)

3. Tugs and trains are likely to be a critical factor in determining width of hospital streets and corridors within some service departments. Special attention should be paid to the space implications of tugs and trains stopping outside departments for unloading or loading. (Where individual trolleys are disconnected and moved manually within departments — see 'TROLLEYS/MOBILE EQUIPMENT (LARGE)' — drawings.)

Activities:
Straight movement, movement through openings

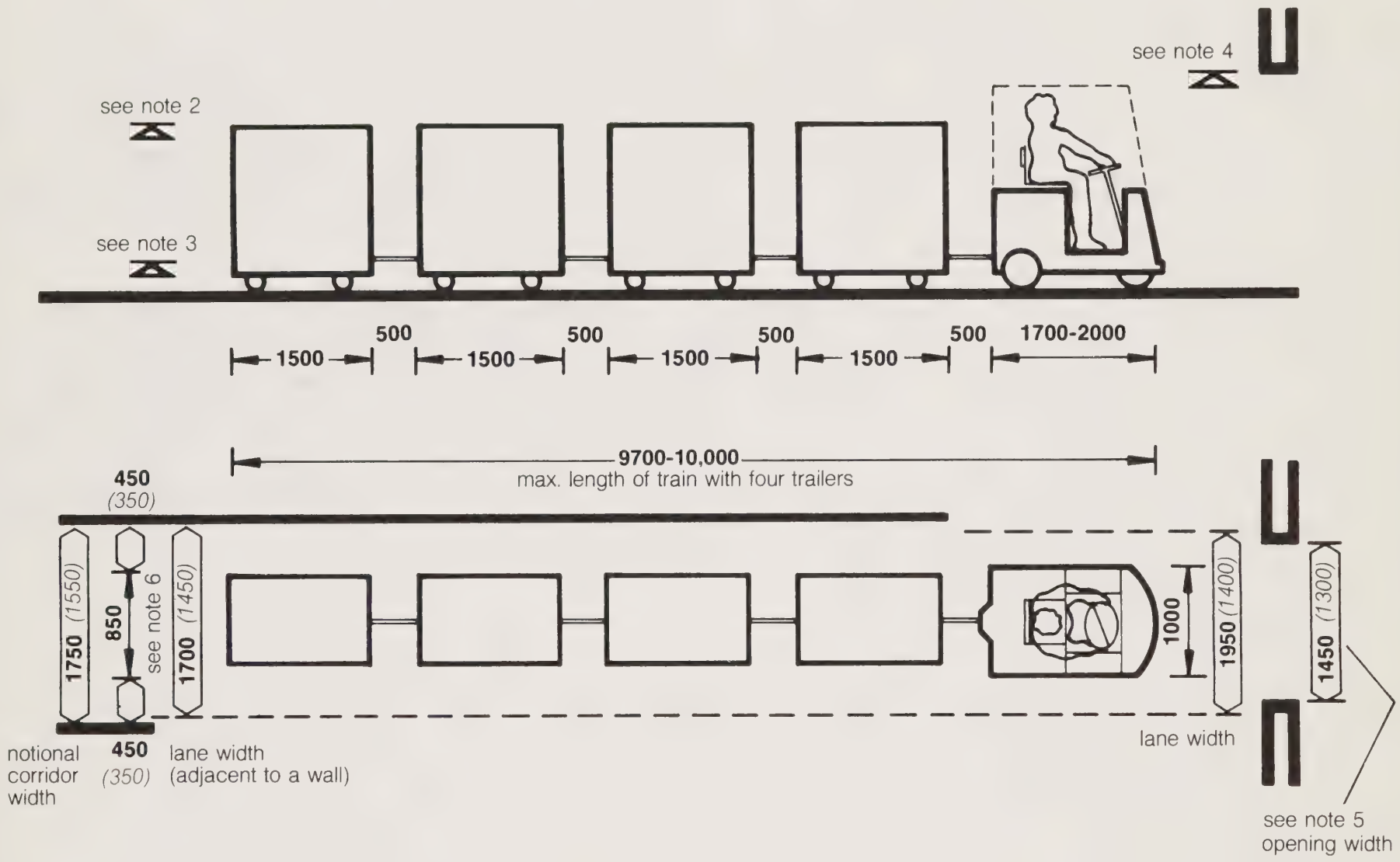
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & Trains

8H8

Rider operated,three wheeled battery driven. Trailer 1500 x 850 (see note 6)

Users:
Trained driver



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Activity dimensions refer to requirements for trolley train movement with up to a maximum of 4 trolleys.

2. Preferred max. height of trailers is 1500. Many trailers currently in use do exceed this, and consequently do present difficulties for driver visibility, ideally requiring greater operating space than recommended here for safe use in public areas. Minimum height of trailer platform or trolley bottom shelf 300.

3. Heavy and long items should be loaded on to trailer platform at this level only.

4. Opening height 2000-2100 — tug without drivers cab, as generally used for most internal journeys. Opening height 2100-2200 — tug with drivers cab, used for external journeys only, and usually require access to principal stores areas only — ie they do not require access to public or patient areas.

5. Here door opening recommendations refer to straight movement only and are **not** satisfactory for use near bends or turns. A clear distance of 8000 (6000) is recommended for satisfactory manoeuvre. See also "turning into opening" data sheet.

6. Larger trailers are commercially available, up to approximately 2000 long. Width may be similar to that shown (ie 850), but occasionally platform trailers may be up to 1000 wide. increased length only will not significantly affect space required for straight movement — an additional 50 would cover increased tracking problems in respect of corridor, lane and opening widths respectively. (No addition is recommended in respect of restricted movements).

Where 1000 wide trailers are used 200 (150) should be added to the dimensions shown.

Activities:
Turning train through 90⁰ bend
(B) Corner without chamfer

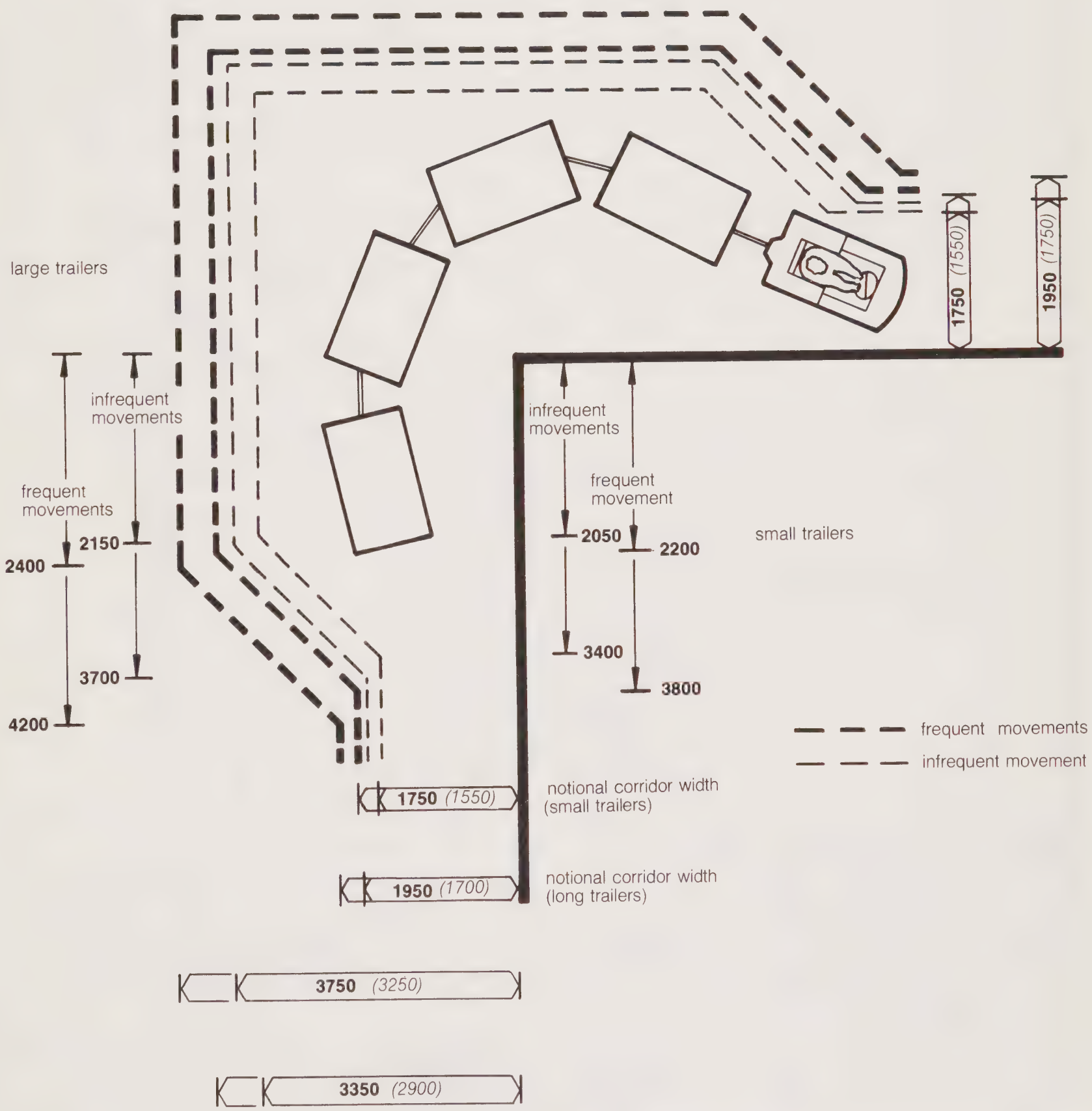
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & Trains

8H9

Rider operated, three wheeled battery driven. Trailer 1500 x 850 (see note 6)

Users:
Trained driver



1350 (1300)

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. All dimensions refer to tug pulling 4 loaded trailers/trolleys.

Small trolleys/trailers 850 wide x 1500 long — recommended maximum.

Larger trolleys/trailers 1000 wide x 2000 long **not** recommended for use in public areas. See also TUGS & TRAINS (1) note 6.

Activities:
Turning train through 90 bend

(A) Corner chamfer requirements

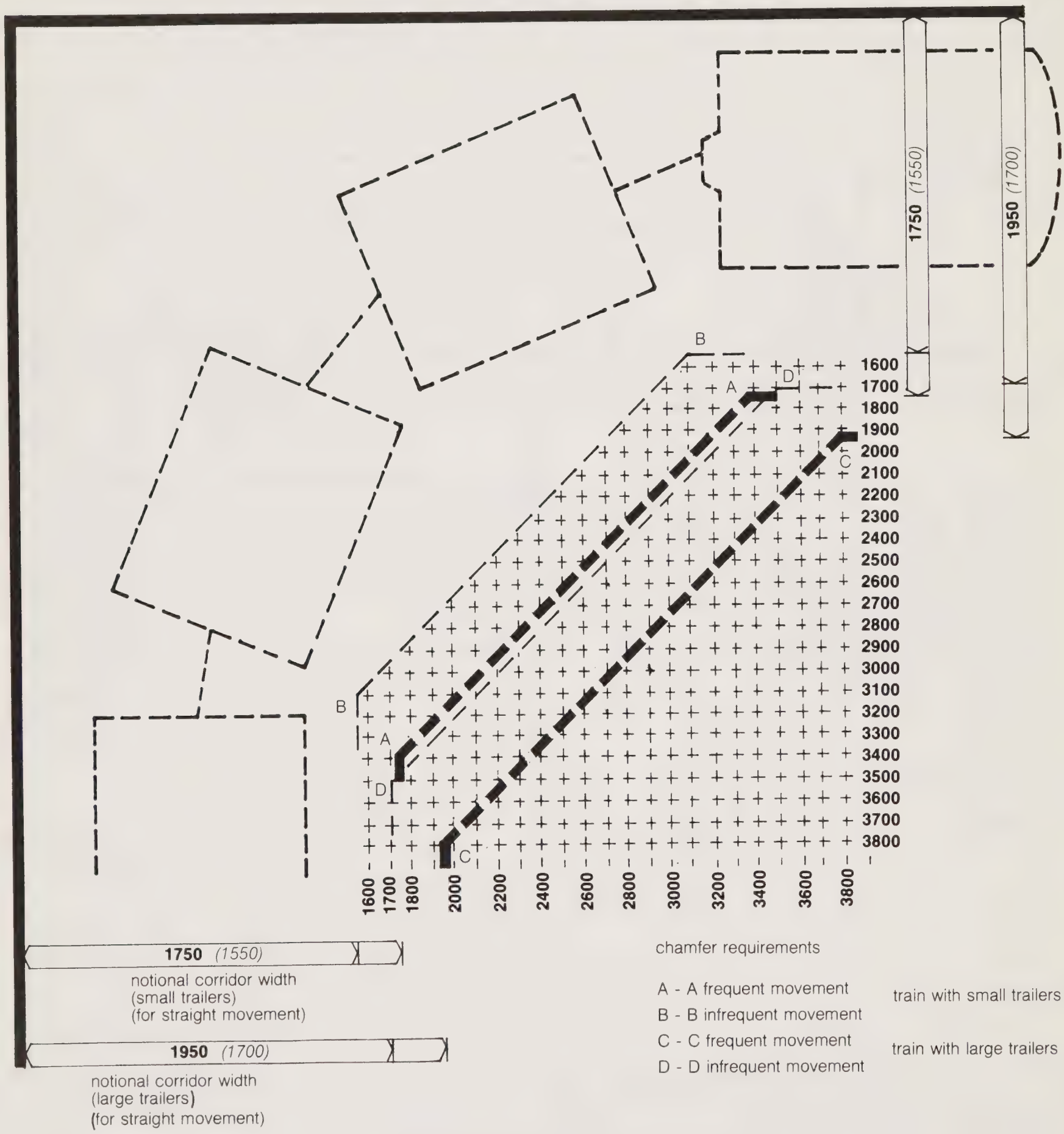
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & Trains

8H8

Rider operated, three wheeled battery driven.

Users:
Trained driver



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

trailers/trolleys.

Small trolleys/trailers 850 wide x 1600 long — recommended maximum.

Larger trolleys/trailers 1000 wide x 2000 long **not** recommended for use in public areas.

Notes:

1. All dimensions refer to tug pulling 4 loaded

Activities:
Turning train through 180°

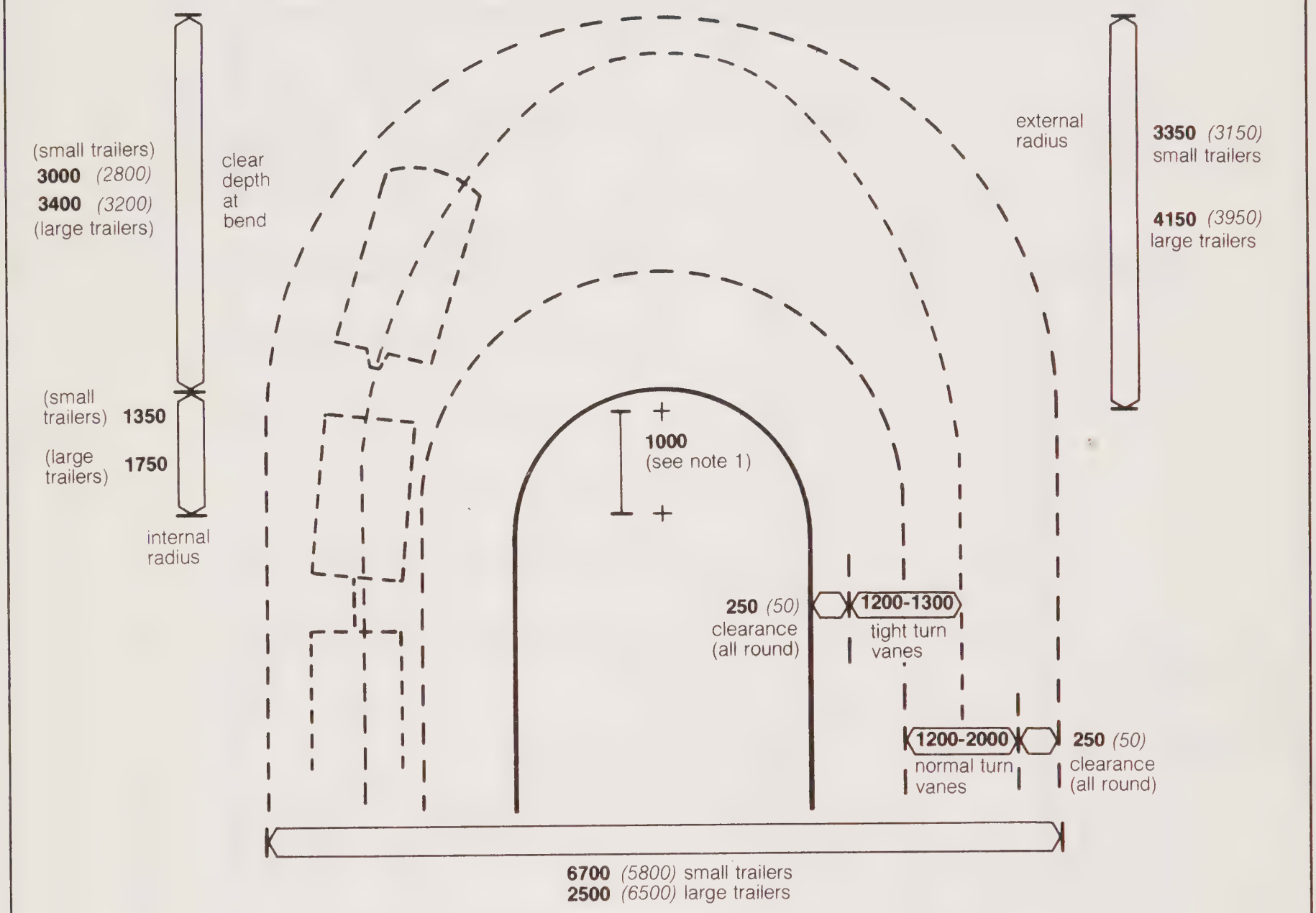
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & Trains

8H10

Rider operated three wheeled battery driven.

Users:
Trained driver



1350 *(1300)*

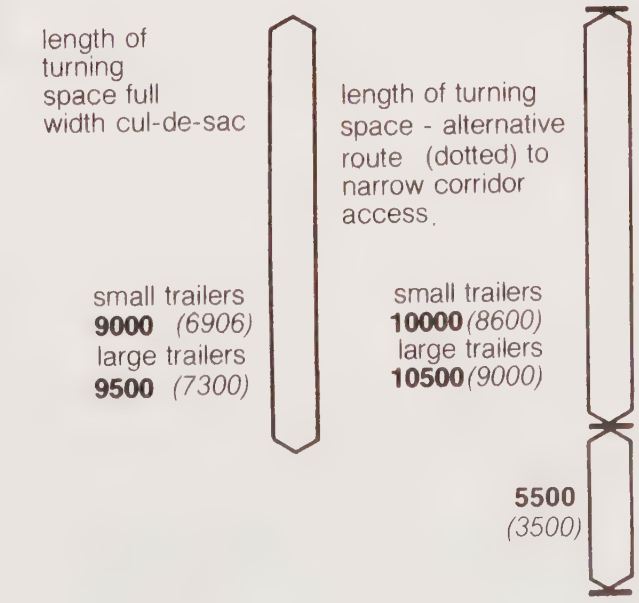
Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

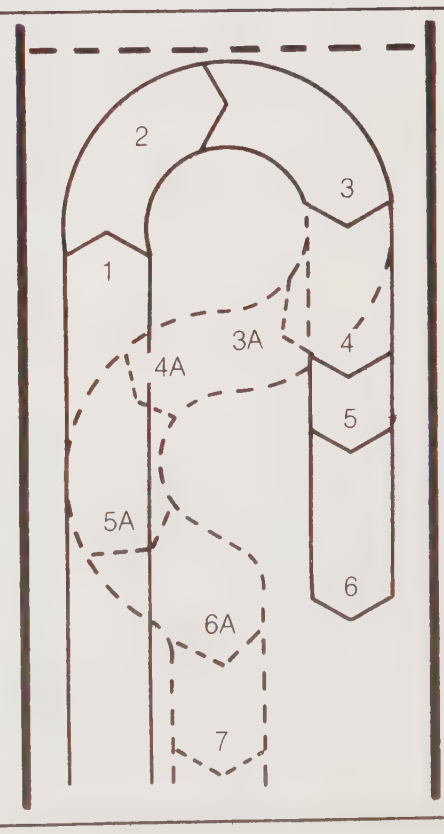
Notes:
1. 1000 - essential minimum allowance for operating and tracking variations on bend.

Turning train through 180°

1 Straight line
2 Right hand turn
3 Full lock
4 Wheels straightened
5 Correct dimension of travel
6 Straight line

Alternative route
3A Full lock continued
4A Reverse full lock
5A Wheels straightened
6A Correct direction of travel
7 Straight line





Activities:
Turning into or out of an opening width of 2400

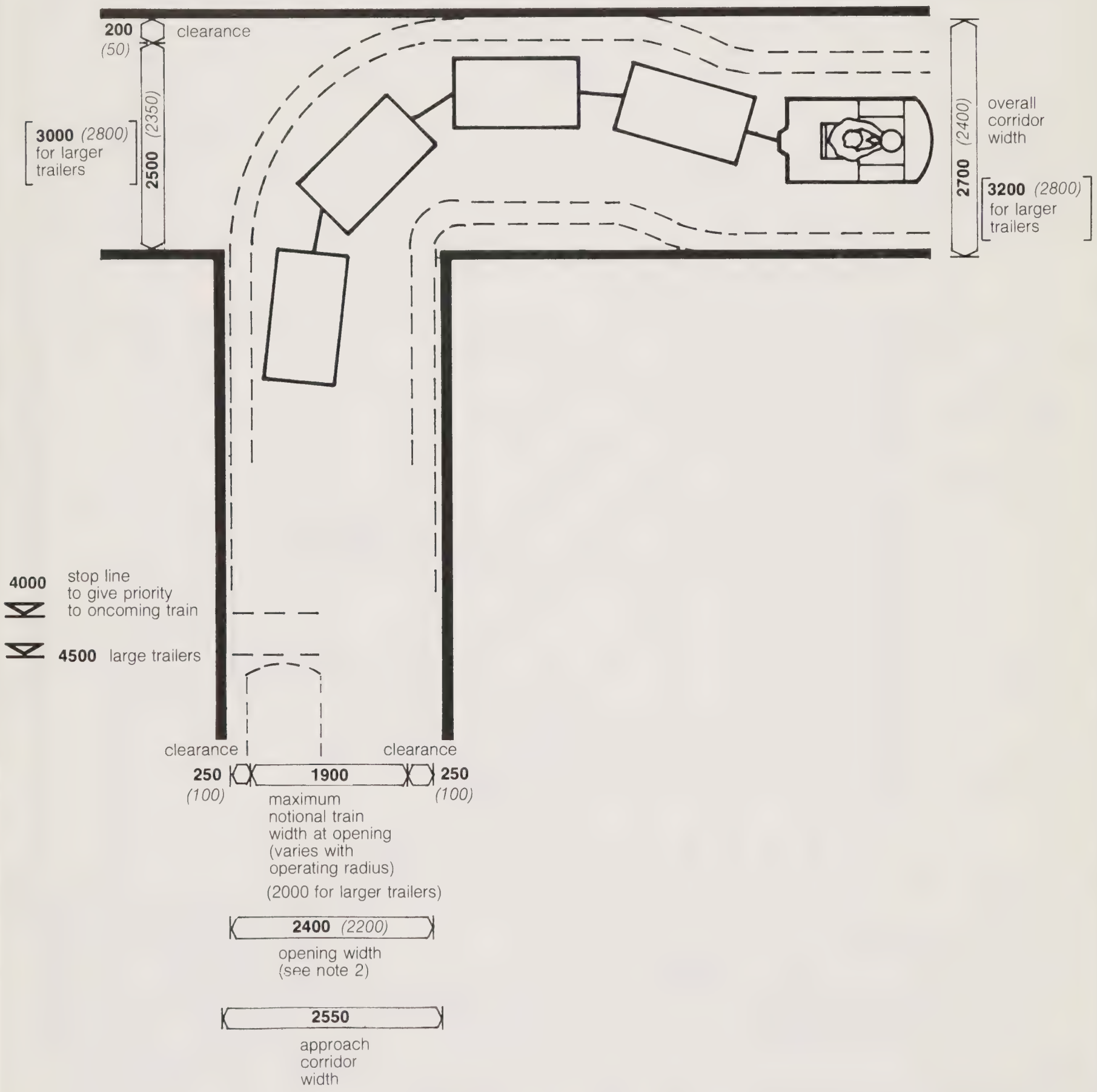
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & Trains

8 H 7

Rider operated, three wheeled battery driven

Users:
Trained driver



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. All dimensions refer to rider operated tugs pulling a maximum of 4 loaded trailers/trolleys. Smaller trailers — 850 wide x 1500 long — recommended maximum. Larger trailers — 1000 wide x 2000 long — **not** recommended for use in public areas.

2. Extreme care is needed where restricted opening width occurs concurrently with restricted corridor width. Their concurrent use cannot therefore be recommended even where train movements are very infrequent.

Activities:
Ramps — allowing one way traffic.
Ramps — allowing two way traffic.

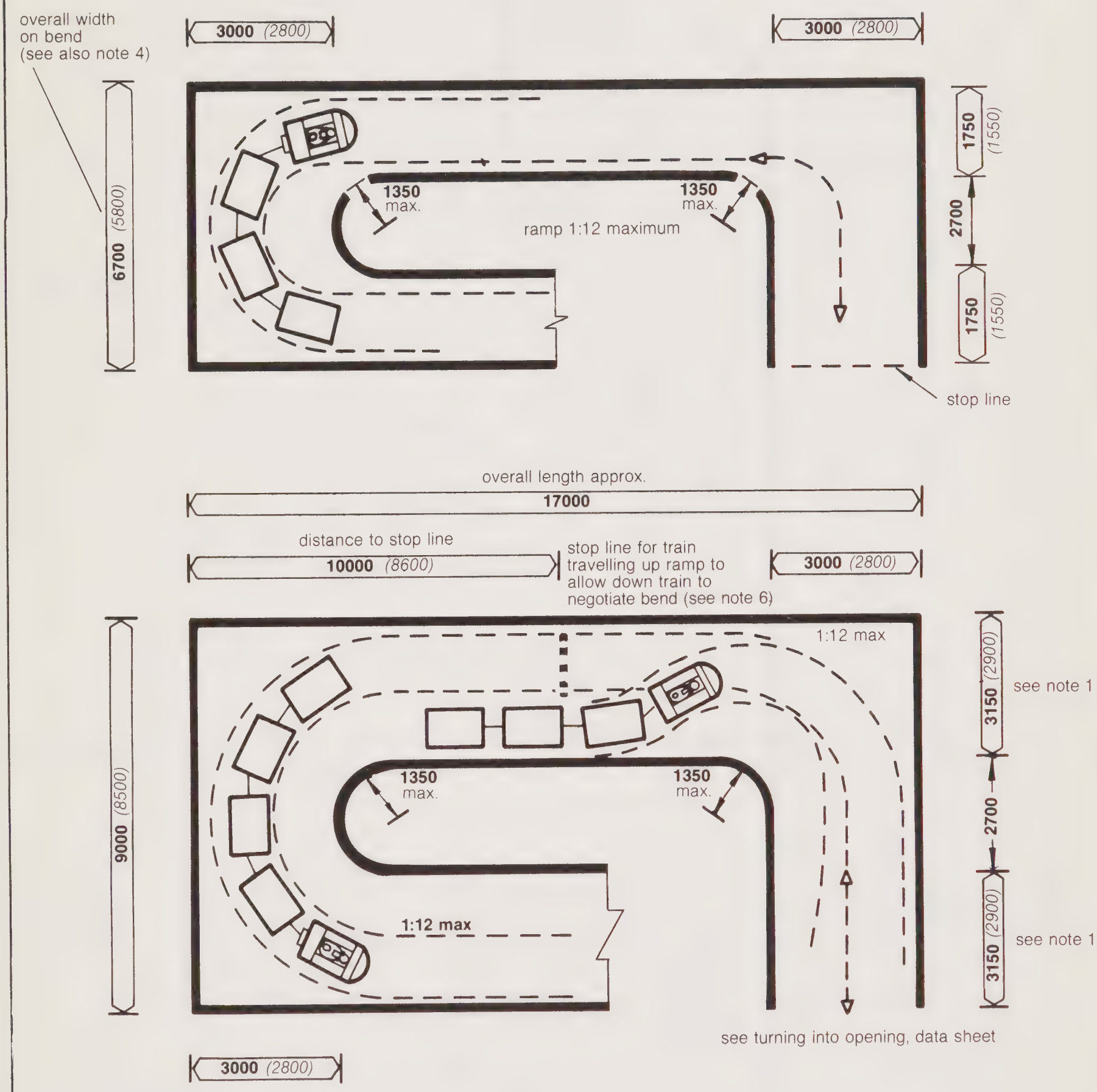
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & Trains

8H6

Rider operated, three wheeled battery driven. Trailer 1500 x 850

Users:
Trained driver



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The need to limit the size of ramp structures for reasons of cost, automatically imposes constraints upon the freedom of train movements; especially on bends, requiring that one train slows or stops to allow the other to pass. It is therefore assumed in these recommendations that ramp legs will allow for the free movement of 1 train and only restricted space for the other train; also that passing on bends is not required.

2. Trains travelling up the ramp should always travel in the outside lane position where the gradient on bends is less severe.

3. Dimensions refer principally to smaller trains (see Tugs & Trains (1).

4. The working limit of a train turning through 180^0 is 2700 radius (5400 diameter). An essential minimum allowance of 2 x 200 is required to accommodate operator error during normal working (see also 180^0 bend data sheet).

5. Restricted spaces generally cannot be recommended for ramped conditions. Ideally space more generous than the recommended minimum for straight movement should be provided.

6. Priority should preferably be given to trains travelling down ramp, owing to tendency for loaded trailers to 'jack-knife' when braked hard on a gradient, and the consequential danger of injury or damage and inconvenience.

Activities:
Lay-by

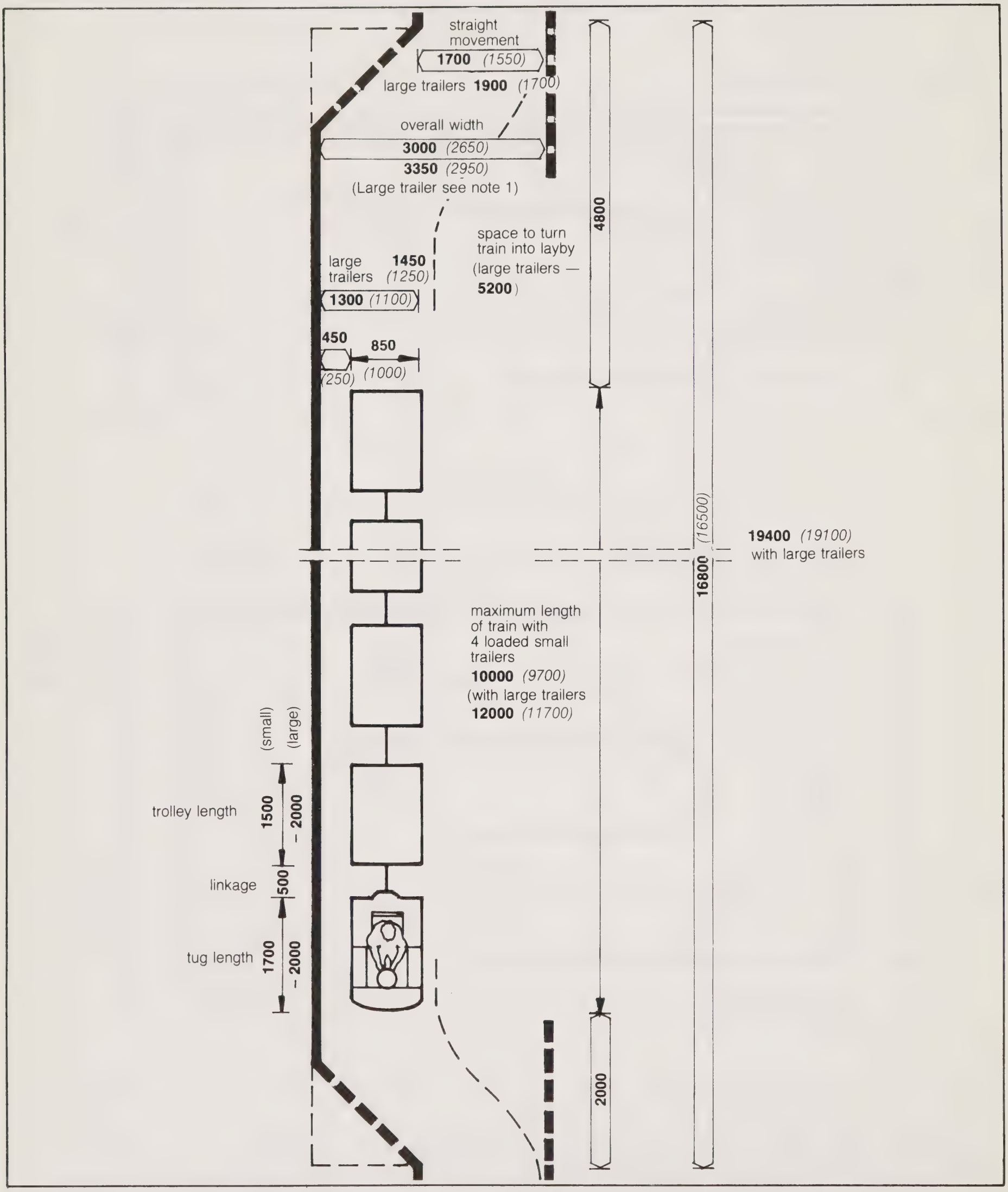
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tugs & trains

8H5

Rider operated three wheeled battery driven. Trailer 1500x850

Users:
Trained driver.



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. All dimensions refer to tug pulling 4 loaded trailers/trolleys. Small trolleys/trailers 850 wide x 1500 long — recommended maximum. Larger trolleys/trailers 1000 wide x 2000 long not recommended for use in public areas

Activities:
Basic dimensions
Straight movement and movement through openings.

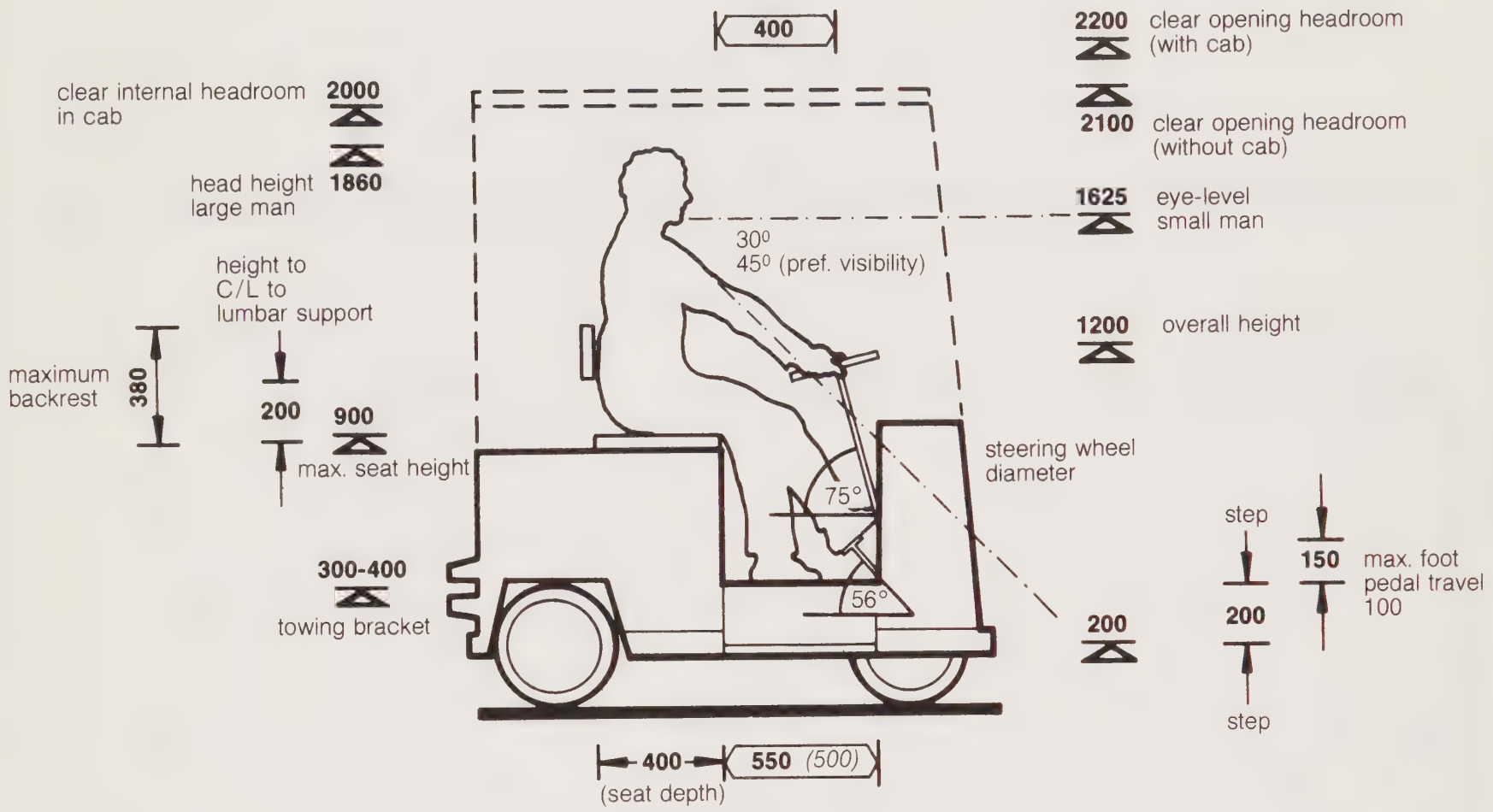
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

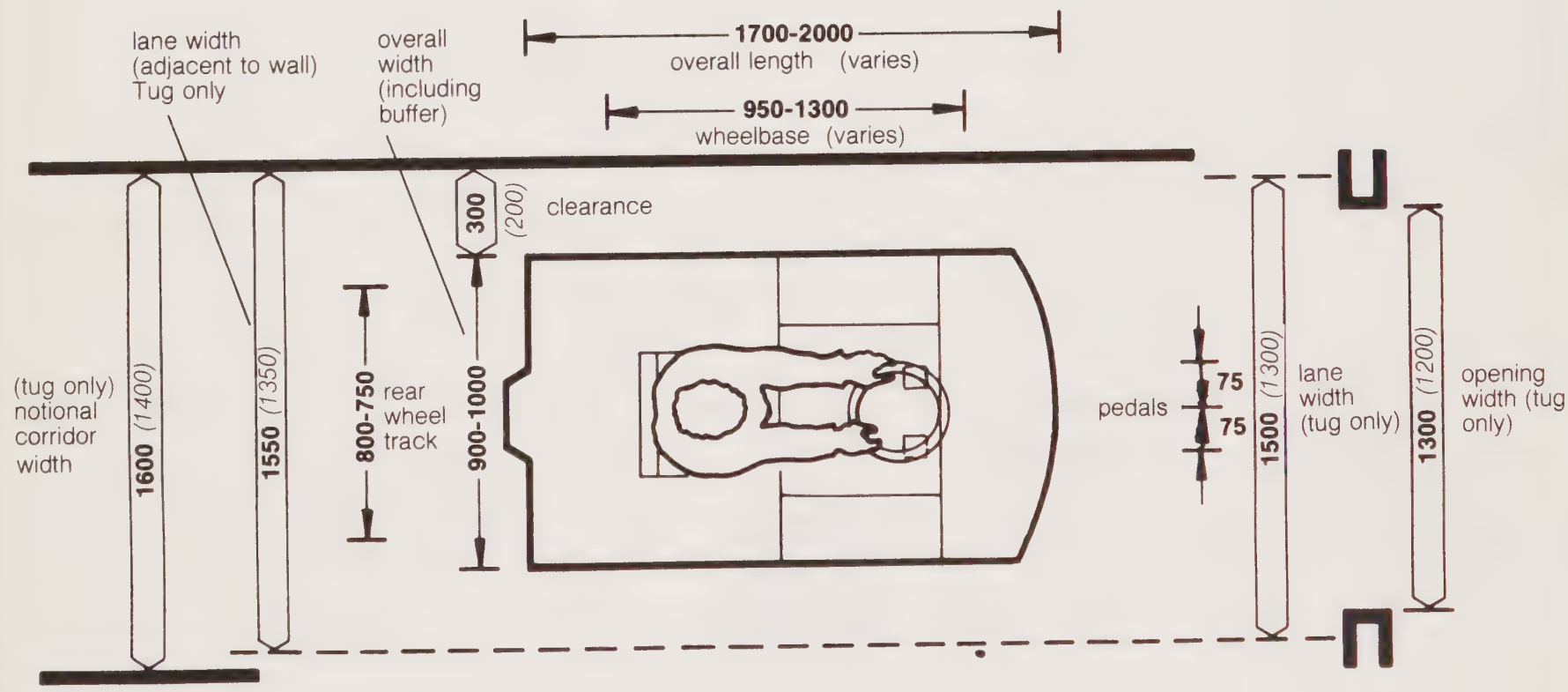
8 H 1

Tug

Rider operated, three wheeled battery driven type.

Users:
Trained driver





1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Speed performance requirements. The tug with 4 fully loaded trailers must be capable of maintaining a speed of 2 mph up a ramp of 1 in 12 gradient, and must preferably not exceed a speed of 4 mph over the level. (In practice, in order to achieve the first requirement, the second is almost invariably exceeded. It should be noted therefore, that speed tends to contribute significantly to most accident situations, and allowance must take this into account).

Activities:
Turning tug through 180°

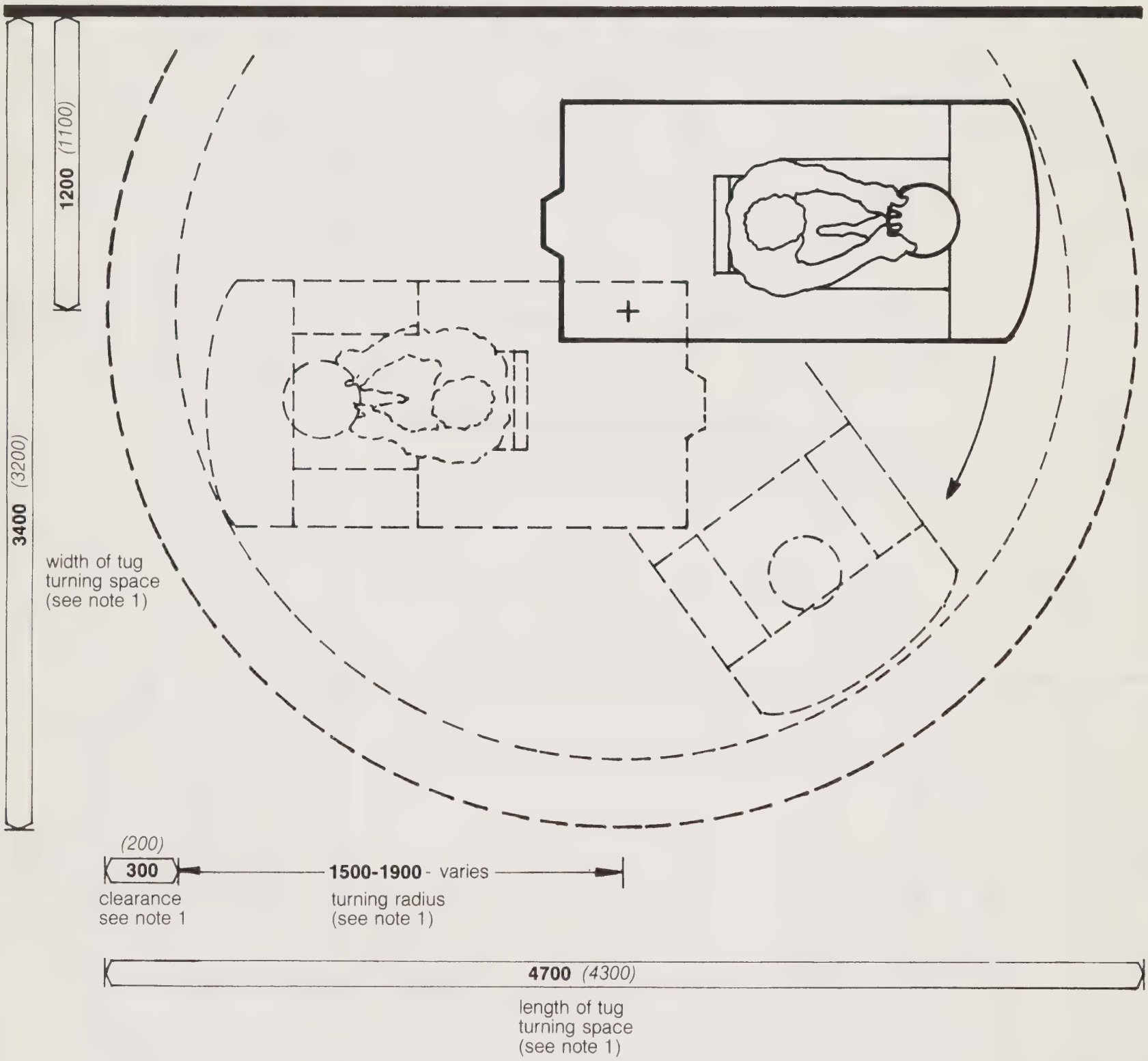
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

8H3

Tug

Rider operated three wheeled, battery driven

Users:
Trained driver



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. The turning radius tends to be a theoretical minimum, achievable only under ideal conditions. During normal working conditions an additional allowance for operator error is essential. The effective minimum working turning will not be less than the turning radius plus 100-200 (300 preferred).
Three point turns can be negotiated in widths of 2000 to 2500 depending upon tug size. This however tends to be a ponderous procedure which can cause delay and damage to building fabric and equipment.

A clear operating width of at least 3700 is generally preferred to minimise building fabric and equipment damage. However, smaller tugs can turn in 3000, with a working limit of 2800 or less.
It is recommended however that space should accommodate the larger tugs, as these are more frequently used, in view of their better mechanical performance, especially where ramps (1:12 max) are to be negotiated. Similarly turning space length should be at least 4800, although small tugs can turn in 3500 with a working limit of approx. 3100.

Activities:
Charging bay

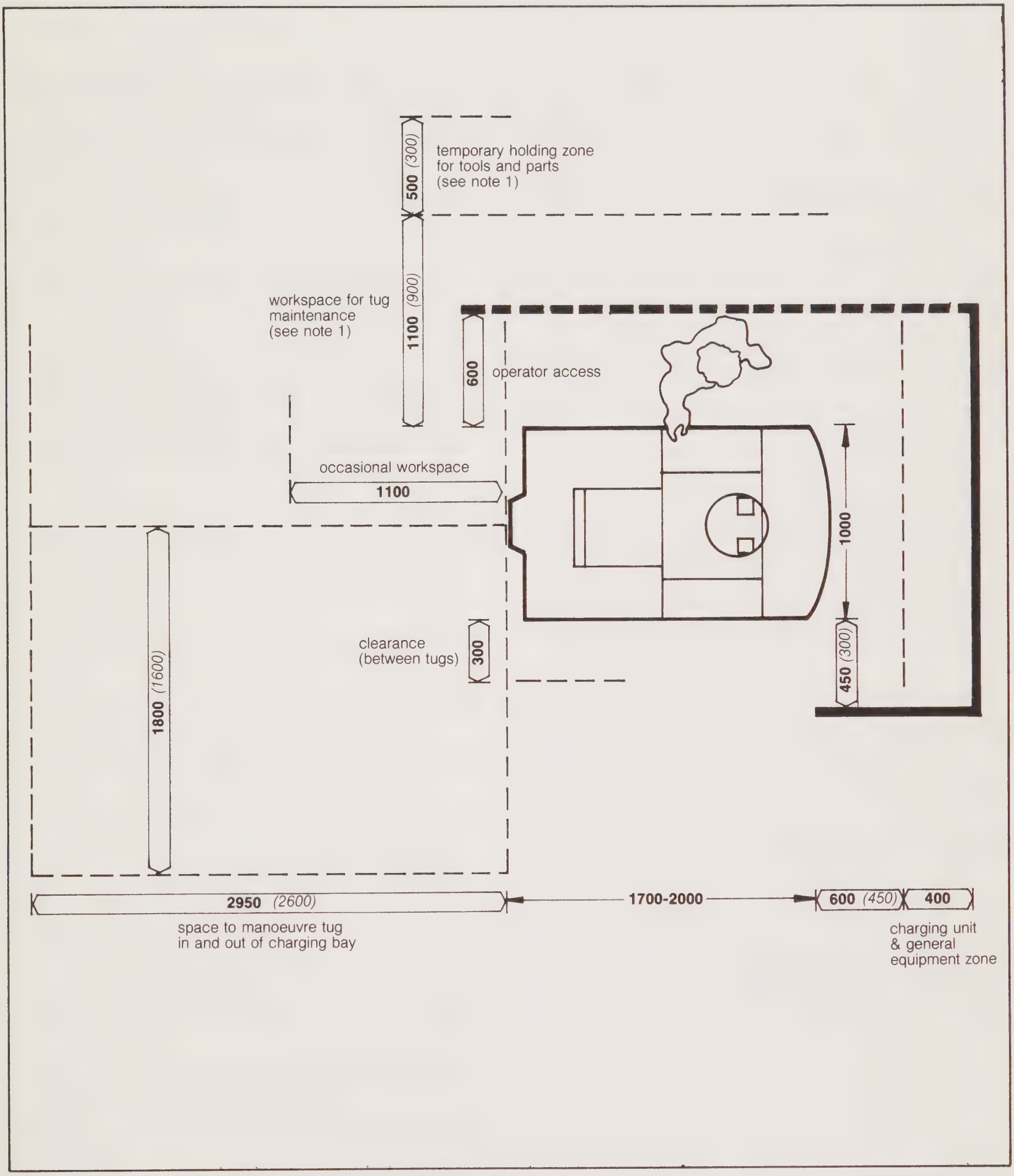
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Tug

8 H 2

Rider operated three wheeled battery driven

Users:
Trained driver



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Charging bay may be combined with a work-shop area for tug maintenance and would include workbench, sink etc. Tugs being serviced in such an area, would require work-space and tool and parts holding zone shown above on both sides of tug.

References

1. **Department of Health and Social Security.** Common Activity Spaces Vol I Health Building Note 40. London, HMSO.
2. **Department of Health and Social Security and Welsh Office.** Access and accommodation for engineering services. Hospital Technical Memorandum 23, London, HMSO, 1972. 36pp (To be revised)
3. **Department of Health and Social Security and Welsh Office.** Health building procedures (Capricode) London, DHSS 1969. (To be revised)
4. **Department of Health and Social Security and Welsh Office.** Fire safety in health care premises — Planning and design of new health buildings. Health Technical Memorandum 81 London, HMSO. (In preparation).
5. **Department of Health and Social Security.** Signs, Health Technical Memorandum 65. London DHSS.
6. **Department of Health and Social Security and Welsh Office.** Fire safety in health care premises — Fire alarm and detection systems. Health Technical Memorandum 82, London, HMSO.
7. **Department of Health and Social Security and Welsh Office.** General fire precautions (1982). Health Technical Memorandum 83 London, HMSO.
8. **Department of Health and Social Security and Welsh Office.** Furniture, furnishings, bed assemblies, apparel. Health Technical Memorandum 87 London, HMSO.
9. **Department of Health and Social Security and Welsh Office.** Means of escape in existing buildings. Health Technical Memorandum 85 London, HMSO.
10. **Department of Health and Social Security and Welsh Office.** Safety evaluation scheme. Health Technical Memorandum 86 (In preparation)
11. **Department of Health and Social Security and Welsh Office.** Planning and design of new residential accommodation for the elderly. Health Technical Memorandum 84. (In preparation).
12. **Chartered Institution of Building Services.** Lighting guide: hospitals and health care buildings. CIBS, 1979. 80pp (Publication No 12).
13. **Department of Health and Social Security and Welsh Office,** Flooring, Health Technical Memorandum 61, London, HMSO.
14. **Department of Health and Social Security.** Floor covering study group. Carpet/Textile/Soft floor section report. DHSS, 1978, 14pp. (Enclosure to HN (78)32-WHN (78)92 in Wales).
15. **Department of Health and Social Security and Welsh Office.** Partitions, Health Technical Memorandum 56, London, HMSO.
16. **Department of Health and Social Security and Welsh Office.** Ceilings Health Technical Memorandum 60, London, HMSO.
17. **Department of Health and Social Security and Welsh Office.** Internal doorsets Health Technical Memorandum 58, London, HMSO.
18. **Department of Health and Social Security and Welsh Office.** Ironmongery Health Technical Memorandum 59, London, HMSO.
19. **Department of Health and Social Security.** Buffering of movable equipment. DHSS, 14 February 1975. DS (Supply) letter 42/75.
20. **British Standards Institution.** CP 413. Ducts for building services.
21. **Health and Safety at Work** etc Act 1974 (Ch 37) HMSO, 1974. 117pp.
22. **British Standards Institution.** BS 5839: 1980. Fire detection and alarm systems in buildings; Part 1. Code of practice for installation and servicing (Revision of CP 1019).
23. **Department of Health and Social Security.** Health services management — Hospital Design Note 4 (noise control): amendments to Appendices II, IV and VIII. (HN(76)126) London, DHSS, 1976. 2pp (WHN(77)1 in Wales).
24. **Department of Health and Social Security.** Noise and vibration. Hospital Service Engineering Data Sheet DH 1.2, London, DHSS, 1977. 24pp.
25. **Department of Health and Social Security.** Heat emitters. Hospital Service Engineering Data Sheet DN4. London, DHSS, 1978. 87pp.
26. **Institution of Electrical Engineers.** Regulations for electrical installations. 15th edition IEE, 1981. 216pp.
27. **Department of Health and Social Security and Welsh Office.** Electrical services: Supply and distribution. Health Technical Memorandum 7. London, HMSO 1977. 48pp.
28. **Department of Health and Social Security and Welsh Office.** Abatement of electrical interference. Hospital Technical Memorandum 14. London, HMSO, 1965. 26pp.
29. **British Standards Institution.** BS 5394 Part 1. Radiated interference limits and measurements for lighting fittings.
30. **Department of Health and Social Security.** Standard reference luminaires for hospital and health building use. DHSS Engineering Data Sheet DE1. London, DHSS, 1978. 36pp.
31. **Department of Health and Social Security.** Electrical lighting specification for good colour rendering fluorescent light source suitable for hospital lighting. Hospital Service Engineering Data Sheet DE 2.1. London, DHSS, 1979. 4pp: and good colour rendering: fluorescent lighting in health buildings. (HN(76)39) London, DHSS, 1976. 2pp (WHN(76)30 in Wales).
32. **Department of Health and Social Security and Welsh Office.** Emergency electrical services. Health Technical Memorandum 11. London, HMSO, 1974 revised. 33pp.
33. **British Standards Institution.** BS 5266, Pt.1: 1975. Emergency lighting. 16pp.
34. **Department of Health and Social Security and Welsh Office.** Staff location systems. Hospital Technical Memorandum 20. London, HMSO 1968. 10pp.
35. **British Standards Institution.** CP 326; 1965. The protection of structures against lightning. 64pp.
36. **Department of Health and Social Security.** Lightning protection for hospitals. Hospital Service Engineering Data Sheet DB2. London, DHSS 1971. 15pp.

Suggested further reading

Department of Health and Social Security and Welsh Office. Windows. Health Technical Memorandum 55. London, HMSO.

Department of Health and Social Security and Welsh Office. Internal glazing. Health Technical Memorandum 57. London, HMSO.

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DHSS Welsh Office

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The following building notes are temporarily out of print pending revised editions, but remain relevant to health building. Any enquiries should be directed to DHSS, Euston Tower, 286 Euston Road, London NW1 3DN (01 388 1188 Ext 3578)

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